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CHAPTER PRESIDENTS AND SECRETARIES

ALBANY—**Abbott S. Weinstein**, 18-B Old Hickory Drive, Albany 4, New York; **Elizabeth H. Christen**, New York Crop Reporting Service, 19th Floor, State Office Bldg., Albany 1, New York

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NEW ORLEANS—**Roland Pertuit**, 4871 Metropolitan Drive, New Orleans, Louisiana; **Elsie M. Watters**, School of Business Administration, Tulane University, New Orleans, Louisiana

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NORTH TEXAS—**Albert W. Wortham**, 3919 Pyka Drive, Dallas, Texas; **Stewart F. Mitchell**, Allstate Insurance Co., 212 North St. Paul, Dallas, Texas

OKLAHOMA CITY—**Richard W. Poole**, Oklahoma City Chamber of Commerce, Skirvin Towers Hotel, Oklahoma City, Oklahoma; **Elsie Lee Brown**, 428 N. W. 25th, Oklahoma City 3, Oklahoma

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SACRAMENTO—**Richard D. Morgan**, 2748 6th Avenue, Sacramento, California; **Maurice K. Strantz**, 3761 El Ricon, Sacramento 21, California

SAN FRANCISCO—**Helen Nelson**, Div. of Labor Statistics and Research, Calif. Dept. of Industrial Relations, P.O. Box 965, San Francisco, California; **Phillis Beattie**, U. S. Bureau of Labor Statistics, 630 Sansome Street, Room 802, San Francisco 11, California

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VIRGINIA—**John E. Freund**, Virginia Polytechnic Institute, Dept. of Statistics, Blacksburg, Virginia; **Clyde Y. Kramer**, Department of Stat. and Stat. Lab., Virginia Polytechnic Institute, Blacksburg, Virginia

WASHINGTON, D. C.—**Rexford C. Parmelee**, 4700 47th Street, N. W., Washington 16, D. C.; **Dorothy M. Gifford**, Head, Statistics Branch Office of Naval Research, Washington 25, D. C.

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News and notes should be sent to Dana Barbour, News
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NEWS **New B. & E. Statistics Section Proceedings Voted — Spes Activities — Conferences — Publications — Job Openings**

Business and Economic Section Proceedings

The Board of Directors of the American Statistical Association, at its meeting April 27, approved the plans of the Business and Economic Statistics Section to publish its Proceedings. The Section's plans follow the recommendations of a Section Publication Committee, established following the December 1955 Annual meetings, to study the joint problems of how to obtain better communication among the members of the Section and what should be published by the Section. After extensive investigation, the Publication Committee, consisting of Walter F. Ryan, Chairman, Henry W. Steinhaus, and Martin R. Gainsbrugh, recommended that the 1955 and 1956 proceedings be published together in one volume. Joint publication would have the advantage of minimizing costs, avoiding duplication, and improving prospects for widespread distribution of the volume to members of the Section and to the many others interested in the topics of the papers. It also would permit maintaining continuity with the practice, started on an experimental basis in 1954, of publishing the Section's Proceedings. The 1954 volume contains a great deal of information which is still valuable and pertinent to current issues. Copies are still available from the national office of the Association, at a price of \$2.00 a copy.

An editorial and management committee has been established to review the papers for inclusion, and to develop detailed plans for publication, distribution, and financing of the combined 1955 and 1956 Proceedings of the Business and Economics Statistics Section. This committee consists of George Cline Smith, of the F. W. Dodge Corporation and Section Vice-Chairman for Publications; Martin R. Gainsbrugh, of the National Industrial Conference Board; Henry W. Steinhaus, of the Equitable Life Assurance Society; Ralph E. Burgess, of the American Cyanamid Company; George Garvy, of the Federal Reserve Bank of New York; Helen Slade, Editor, *Analysts Journal*; and Walter F. Ryan, of the Office of Statistical Standards, Bureau of the Budget. Mr. Ryan will act as Editor for the 1955 papers. Mr. Steinhaus will be Editor for the 1956 papers. Mr. Smith will serve as Coordinating Editor for both parts of the volume and will direct arrangements for reproducing, advertising, distributing, and financing the publication. Papers read at the 1955 meetings should be sent as soon as possible to the national office. To be assured of consideration for publication, the 1956 papers should be ready for submission by the time of the meetings in Detroit. It is planned that the volume will be available for distribution late this year or early in 1957.

New SPES Committees

At the annual business meeting of the Section on Physical and Engineering Sciences, December, 1955, it was voted that the Chairman appoint a committee to investigate the possibility of the publication of a journal whose province would be those papers dealing with the application of statistics in, and the impact of statistics on the physical sciences. The membership of this committee is:

Edwin G. Olds, Statistics, Carnegie Tech, *Chairman*

Ralph H. Bacon, Physics, General Precision Laboratory, Inc.

J. M. Cameron, Statistics, Bureau of Standards

Mavis B. Carroll, Statistics, General Foods Corp.

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Mason E. Wescott, Quality Control, Rutgers University

Miles Hardenburg, Chemistry, Army Chemical Center

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The following Committee has been appointed to explore the possibility of SPES sponsoring traveling lectures as is done by Sigma Xi and also to explore the introduction of statistics into the Sigma Xi series.

A. H. Bowker, Stanford University, *Chairman*

Benjamin Epstein, Wayne University

Richard Freund, Eastman Kodak Company

William R. Pabst, Bureau of Ordnance, Navy Department

Statistical Seminar at MIT Sponsored by SPES

The Statistical Summer Seminar formerly held at the University of Connecticut will be held this summer at Endicott House of the Massachusetts Institute of Technology during the period of August 13-25, inclusive. Two one-week programs will be offered. The first week will be under the chairmanship of Mr. Leo Tick of New York University on the general topic of "Time Series"; the second week, under the chairmanship of Dr. Max Woodbury with the topic, "The Impact of Computers on Statistics." The ASA Section on Physical and Engineering Sciences is sponsoring these sessions. Requests for information and reservations should be sent to Dr. M. E. Terry, Bell Telephone Laboratories, Murray Hill, N. J.

Publication of New Sociological Journal

The American Sociological Society, publisher of the *American Sociological Review*, announces the publication of *Sociometry: A Journal of Research in Social Psychology*. Leonard S. Cottrell, Jr., Social Psychologist, Russell Sage Foundation, is the new editor. It will report the best research in social psychology, and at the same time provide an outlet for the developing body of theory in this field.

The annual subscription rate to *Sociometry* is \$9.00. Correspondence regarding subscriptions should be addressed to The American Sociological Society, New York University, Washington Square, New York 3, New York.

Ninth Session of UN Statistical Commission

The United Nations Statistical Commission held its ninth session at UN Headquarters in New York from April 16 to May 2, 1956. The following members and alternates from the 15 countries represented on the Commission attended the session: Australia, S. R. Carver; Canada, H. Marshall; China, Choh-Ming Li; Denmark, H. Larsen; Dominican Republic, K. L. Dipp Gomez; France, R. Dumas; India, P. C. Mahalanobis (who served as Chairman) and B. Ramamurti (Alternate); Netherlands, Ph. J. Idenburg (who served as Rapporteur); New Zealand, G. E. Wood; Panama, Miss Luisa E. Quesada; Ukrainian S. S. R., L. M. Koretsky; U. S. S. R., T. V. Ryabushkin; United Kingdom, H. Campion and J. Stafford (Alternate); United States, R. T. Bowman; Yugoslavia, D. Vogelink (who served as Vice-Chairman) and M. Macura (Alternate). The following were among the representatives of Specialized Agencies and non-governmental organizations present at the session: R. J. Myers (ILO), P. L. Sherman and L. P. D. Gertenbach (FAO), B. A. Liu (UNESCO), E. Hicks, W. Gardner and P. Host-Madsen (IMF), A. M. Lester and F. X. Byrne (ICAO), Ruth Puffer (WHO), G. L. Ridgeway and Mrs. R. Lusardi (ICC), L. Teper (ICFTU), S. A. Rice (ISI) and T. H. Montenegro (IASI). The United States Representative, Raymond T. Bowman, who is Assistant Director for Statistical Standards, Bureau of the Budget, was assisted by the following advisers: J. Edward Ely, Harvey Kailin and Conrad Taeuber of the Bureau of the Census, and Harry Venne-man of the Office of Statistical Standards, Bureau of the Budget.

In general, the actions taken and decisions reached by the Commission at this session reflected the view that greater emphasis should be given at present to efforts to improve the adequacy and quality of national statistics, rather than to further development or elaboration of international standards aimed primarily at improving international comparability. The conclusions reached on the principal agenda topics are stated very briefly in the following paragraphs. Copies of the full report on the session may be obtained from the Statistical office of the United Nations, New York, N. Y.

Distribution statistics. The Commission approved a list of important elements in a program of distribution statistics for the guidance of countries undertaking work in this field, and requested that further study be made of national practices and of concepts and definitions used.

Demographic statistics. Agreement was reached on recommendations relating to the 1960 World Population Census program and on steps to be taken in preparation for the program, including provision of technical assistance. Considerable satisfaction was expressed with the results of work in the field of vital statistics, but the need was stressed for greater efforts to improve the quality of the data.

External trade statistics. Except for agreement on relatively minor questions relating to effects of multiple exchange rate systems and to treatment of marine products, the Commission deferred further recommendations in this field pending study of the problems involved.

Industrial statistics. The Commission decided that it would reexamine, at its next session, recommendations previously adopted on basic industrial statistics and on the International Standard Industrial Classification

and indicated steps to be taken in preparation for this review. It also considered possible draft recommendations on statistics of enterprises, but decided to defer action pending further study.

Wholesale price statistics. Agreement was reached on the need for continued study and on the problems which should receive particular attention in future work.

National income and related measures. The Commission reviewed progress reports on work since its last session on national accounts, statistics of capital formation, price and quantity indexes in national accounting, and statistics of the distribution of income, and expressed its views on the direction of further work on these subjects.

Social statistics. The Commission gave further consideration to the question of definition and measurement of standards and levels of living, and made a number of observations on problems of methodology in this field. It emphasized the value of such studies for national purposes as contrasted with their use for international comparisons, and recommended that studies on concepts, definitions and methods of measurement in this field be continued and intensified. The Commission also reviewed progress reports on work in the fields of housing statistics, family living studies, educational and cultural statistics, and classification of occupations, and expressed its views on a number of aspects of future work on these subjects.

Other subjects. The Commission also discussed, and in some cases took action upon, working papers or progress reports on a number of other topics, including: Balance of payments statistics, classification of government financial accounts, regularization of production and employment at a high level in the metal trades, statistics of tourism, and several subjects referred by the Population Commission. It noted with approval a proposal to establish a Conference of Asian Statisticians; restated its previous recommendation on creation of an advisory statistical field service; and recommended that increased emphasis be given in planning and operation of technical assistance programs to the needs of underdeveloped countries for assistance in statistics, especially social statistics. Finally, it agreed to include in its future program work on development of a basic list of important statistical series for use by countries desiring guidance in the establishment or development of an integrated system of statistics to meet national needs.

Bibliography on Administrative Applications of Statistical Quality Control

The Administrative Applications Division of the American Society for Quality Control has recently issued a 21-page bibliography on "Administrative Applications of Statistical Quality Control". The bibliography includes both books and articles dealing directly or indirectly with administrative applications of statistical quality control techniques. No attempt is made to evaluate the publications or to endorse their contributions, however. The bibliography, which sells for 25 cents, was prepared by the Publications Committee, consisting of W. R. Pabst, Jr., Chairman, Charles A. Bicking, Leon Gilford, E. T. Magruder, A. C. Rosander and Archie Sabin. Communications regarding it should be addressed to William F. Buhl, Secretary, Administrative Applications Division, ASQC, 3950 Dell Drive, Barberton, Ohio.

Course on Statistics in the Paper Industry

A two-week statistics course on the application of statistical methods in the paper industry will be held at Queen's University, Kingston, Ontario, July 9 to 20, 1956. It is being jointly sponsored by the TAPPI (Technical Association of the Pulp and Paper Industry) Statistical Methods Committee and the Technical Section, Canadian Pulp and Paper Association. This is the fifth year such a course has been held.

The session will consist of a basic course running concurrently with an advanced seminar. The basic course will deal with paper-mill applications of the basic statistical techniques. It is intended for those who wish to acquire some knowledge of, and facility with, these techniques but have had little or no previous formal training in statistical methods. The advanced seminar will consist of laboratory sessions devoted to the consideration of specific problems in the paper industry and the practical analysis of these problems. The teaching staff will consist of Geoffrey Beall, Chairman of the Department of Statistics at the University of Connecticut; George L. Edgett, Director of Statistical Studies, Queen's University; Harold Freeman, Professor of Statistics at MIT; and Allen E. Paull, Chief Statistician, Abitibi Power and Paper Co. Ltd., Toronto.

Enrollment is limited to 40 in the elementary course and to 10 in the advanced seminar. The fee, which includes board and lodging as well as the cost of instruction, will be \$200 for the elementary course and \$260 for the advanced seminar. Requests for further information should be addressed to K. E. Vroom, Pulp and Paper Research Institute of Canada, 3420 University Street, Montreal 2, Canada, or, in the United States, to Fred R. Sheldon, Becco Chemical Division, Food Machinery and Chemical Corp., Station B, Buffalo 7, N. Y. Applications for enrollment should be sent to Douglas Jones, Executive Secretary, Technical Section, C. P. P. A., 2280 Sun Life Bldg., Montreal, Canada.

Job Openings for Statisticians

Several vacancies exist in the Biometrics Branch, National Institute of Mental Health, Public Health Service, Department of Health, Education and Welfare, Bethesda, Maryland. Starting salaries range from \$4525 to \$6390. Qualifications: Bachelor's degree with graduate study in statistics, mathematics or public health preferred, and research or statistical experience in health, medicine, demography or social science. Appointments will be made from eligibles who can qualify for the United States Civil Service register for the position of Analytical Statistician, Health and Medicine. For further information write to above address.

The Logistics Research Division of the U. S. Naval Supply Research and Development Facility, Naval Supply Depot, Bayonne, N. J., has several openings for statisticians at the Civil Service Grades GS-5 and GS-12. The Logistics Research Division engages in operations research type work for the Bureau of Supplies and Accounts. This work is concerned with inventory management problems in the Navy supply system and tidewater operations and port capacities for the movement of naval material. Data supplied by the Bureau of Supplies and Accounts and supply demand control points are statistically analyzed. Theoretical mathematical and economic formulas are derived from these data. Inquiries should be

addressed to W. Karchere, Lieutenant SC USN, Logistics Research Office.

The Philadelphia Quartermaster Depot has vacancies for an Analytical Statistician (Operations and Administration), grade GS-11, with a starting salary of \$6390, and a grade GS-12, with a starting salary of \$7570. The positions are under Civil Service and offer the advantages of salary increases of \$215 each 18 months, vacations of 13-26 days per year depending on length of service, generous sick leave benefits, life insurance at low rates and excellent physical working conditions. The duties involve supervision over and performance of statistical analysis of the operations of the component units of the installations. Applicants must show at least seven years of progressively responsible experience in analytical or survey statistical work. Undergraduate and graduate study in statistics may be substituted for some of this experience. Interested applicants should write to James J. D'Angelillo, Chief, Employee Utilization Branch, Civilian Personnel Office, Philadelphia Quartermaster Depot, U. S. Army, 2800 South 20th Street, Philadelphia 45, Pa.

NICB 1956 Economic Almanac

The National Industrial Conference Board has recently issued the 1956 edition of "The Economic Almanac." The volume has been extensively revised and much new data added on consumer credit; savings and liquid assets of individuals; Federal, state and local finance; population; stock ownership; central bank reserves and international economic relations. The Canadian section has been expanded to twice its former size. In addition to nearly 800 tables, the 688-page volume includes a glossary of terms frequently used in business reports.

"The Economic Almanac" is published by the Thomas Y. Crowell Co., New York City. The price of the volume is \$3.95.

NBER Conference on Research in Income and Wealth

A meeting of the Conference on Research in Income and Wealth, sponsored by the National Bureau of Economic Research, was held at Princeton on March 23-24. The meeting, which was under the chairmanship of George Garvy of the N. Y. Federal Reserve Bank, was devoted to an appraisal of income data from the 1950 Census of Population and the Current Population Surveys. Four sessions were held, one in the morning and afternoon of each day, at which the following papers were presented:

Some Frontiers of Size Distribution Research—
Thomas R. Atkinson, Federal Reserve Bank of Atlanta

Relation of Census Income Distribution Statistics to Other Income Data—Selma F. Goldsmith, Office of Business Economics

Decennial Census and Current Population Survey Data on Income—Edwin D. Goldfield, Bureau of the Census

Validity of Field Survey Data for Low Income Groups—Eleanor M. Snyder, Bureau of Labor Statistics

Continued on page 25

FEDERAL STATISTICAL ACTIVITIES

Hearings and Report on the 1956 Economic Report

The Joint Economic Committee's Hearings and Report on the January 1956 Economic Report of the President were published early in March. The 727-page Hearings include the testimony presented in 12 days of hearings on various aspects of the President's Economic Report, such as fiscal, monetary, agricultural and natural resources policy. The 1957 statistical program was commented on briefly by a panel of ten representatives of economic interest and research groups from labor, agriculture and business. The volume also contains replies received from organizations and individuals invited to comment on the materials on employment and unemployment statistics presented last November to the Subcommittee on Economic Statistics by Federal agencies.

The Committee Report on the 1956 Economic Report of the President includes the committee findings and recommendations and a statement on its activities of the past year and plans for the coming year; supplemental and minority views; and committee staff papers on the economic outlook for 1956 and a review of the economic outlook materials presented last year for 1955. The Committee Report again this year comments on the need for improvement in economic statistics. Included in its findings and recommendations is the statement:

"We are pleased to note in the President's budget again this year the recognition of the importance of additional economic statistics. The statistical programs have been under continuing study by our Subcommittee on Economic Statistics. Although the Economic Report made much use of available data, it did not discuss the importance to economic management of improving the various statistical programs as called for in the budget.

"We urge the Congress to give strong support to the proposals in the current budget for additional funds for improving our sources of economic intelligence. In the long run, such expenditures to enable early and correct diagnosis of imbalances will make a greater contribution to our economic stability and growth per dollar spent than the much larger sums needed to correct difficulties discovered only after they have grown large and menacing. The response of the Congress to the President's similar recommendations last year was gratifying but not sufficient."

The Subcommittee on Economic Statistics is directed to assist in obtaining favorable action on the 1957 budget for economic statistics and to report to the full committee the final actions of Congress on this budget. It will also continue its interest in the areas covered last year by the five Federal Reserve consultant committees and in employment and unemployment statistics, through review of (1) a report to be submitted by the Office of Statistical Standards, Bureau of the Budget, on progress in implementing the recommendations of the Federal Reserve committees; and (2) responses made by economic interest and research groups to the materials on labor force statistics prepared by Federal agencies last November. The subcommittee will also make a survey during 1956 of the methods used by Government agencies in making economic projections.

The Subcommittee on Economic Stabilization, aided by the committee staff, will undertake in 1956 a study of the "toolchest" of Government activities which might contribute to economic stabilization. Various Federal agencies will be

asked to supply information on programs regarded as potentially useful in promoting maximum employment, production and purchasing power. The Subcommittees on Foreign Economic Policy, Low-Income Families, and Tax Policy will also continue during 1956 to follow legislation and developments and make specific studies in their respective areas.

The Committee Report (Senate Report No. 1606) and its Hearings on the January 1956 Economic Report of the President may be purchased from the Superintendent of Documents, Government Printing Office, Washington 25, D. C., at 35 cents a copy for the report and \$2.00 a copy for the hearings.

—JOHN W. LEHMAN, *Clerk*
Joint Committee on the Economic Report,
U. S. Congress

BLS Response Analysis Survey of Manufacturing Establishments

In any statistical program as large and complex as that of the Bureau of Labor Statistics on employment, hours and earnings, the potential sources of error are necessarily numerous. The monthly BLS estimates of employment, weekly hours and hourly earnings, by industry, for the nation, the States and local areas are based on data in monthly reports covering well over 150,000 industrial and commercial establishments. This is the largest monthly reporting sample of establishments in the world. In this large network of reports and estimates, serious errors could arise from imprecise instructions on the schedule used in collecting the data, inadequate samples of respondents for some industries, inaccurate benchmarks, faulty industrial classification, mistakes in reporting or processing, and other sources.

Many control procedures have been instituted by BLS over the years to minimize errors in the employment, hours and earnings series, and these procedures are now being formulated into a system of quality control. The first large unit of new work to be undertaken in this formal program of quality control is a study of the response patterns of manufacturing establishments. A Response Analysis Survey is now being made of almost 450 firms selected to represent the sample of over 40,000 industrial establishments who report employment, hours and earnings each month on BLS Schedule 790C. The survey consists of personal interviews conducted by professional staff members of the Division of Manpower and Employment Statistics. A questionnaire, respondent interview guide and procedures manual have been developed for use in the survey.

Estimates of employment, hours and earnings can be no better than the original data upon which they are based. It is obvious that the respondents must have a clear understanding of the definitions used and the precise nature of the data requested. Accurate reporting also requires that concepts and definitions used in the program must be consistent with the characteristics of industry so that the information requested is readily available from records usually maintained by business establishments. The immediate objectives of the Response Analysis Survey, therefore, are: (1) to determine how well, or poorly, the concepts and definitions on the employment, hours and earnings schedule are understood; (2) to determine quantitatively the extent and importance of deviations in reporting from the instructions on the schedule;

and (3) to provide information on the record-keeping practices of American industry which underlie the data reported to the BLS. Results of the survey may lead eventually to clarification of the definitions on BLS Schedule 790C, and perhaps even to changes in concepts and instructions to bring them into line with the kinds of information that business records can provide.

During December 1955 and January 1956 teams of interviewers conducted almost fifty pretest visits, mainly in the States of New Jersey, Maryland, Virginia and Georgia. The pretest indicated that it is possible to collect the kind of information needed on reporting and record-keeping practices in manufacturing establishments. Problems encountered by interviewers formed the basis for determining the specific method of approach and for developing an interviewers' manual.

Interviewing of the 450 establishments selected for the Response Analysis Survey began in early April and is expected to be concluded by the end of June. Although most of the questions asked by the interviewer refer, in a general way, to the respondent's record-keeping and reporting practices, some specific quantitative answers are requested in order to provide a measure of the errors in reporting.

—DUDLEY YOUNG,
*Assistant Chief for Statistics,
Division of Manpower and
Employment Statistics,
Bureau of Labor Statistics,
Department of Labor*

Census Bureau Working Paper on Classification of Industry Data

The second in a series of Bureau of the Census Working Papers, developed for the purpose of making available to the public certain working documents of general interest, has been issued. This report, "The Role of the 1954 Census of Manufactures in Overcoming Problems of Industry Data," is based on a paper given by Maxwell R. Conklin, Chief of the Industry Division, Bureau of the Census, at the Annual Meeting of the American Statistical Association on December 27, 1955, in New York City.

The paper attempts to throw some light on the effect of secondary products and intra-plant integration on the relationship among establishment statistics organized in accordance with the Standard Industrial Classification. It points out the advantages as well as the limitations of the system, and discusses means of overcoming the limitations for some purposes by a more flexible use of the detailed industry classifications.

Census Bureau plans are described for publishing, in the 1954 Census of Manufactures reports, more data on materials consumed, installed equipment, and secondary products. Textual descriptions will be expanded to relate such factors as secondary production, intra-industry integration of processes, coverage of products, types of materials and processes used, and other factors having an important bearing on the use of industry data for many different purposes.

This working document will not be sold, but a limited number of copies is available on request to the Industry Division, Bureau of the Census, Washington 25, D. C.

—EDWIN D. GOLDFIELD, *Chief
Statistical Reports Division
Bureau of the Census
Department of Commerce*

Federal Reserve Study of Bank Loans for Business Purposes

The Board of Governors of the Federal Reserve System, in cooperation with the Federal Reserve Banks, conducted a sample survey of member bank loans for commercial and industrial purposes in October 1955. The purpose of the survey, which is similar to those made in 1942 and 1945, is to provide the Federal Reserve System, commercial banks, government agencies and private research organizations with current information needed for analysis of developments in the lending activities of banks.

Types of information obtained in the survey include such major terms and conditions of the loan as amount, maturity, interest rate, repayment method, and collateral; such major characteristics of the borrower as asset size, type of business, form of business organization, and location; and such major characteristics of the bank as size, location, and reserve class. In addition, information was obtained on bank policies governing lines of credit and minimum deposit requirements for business borrowers.

The 1955 survey was confined to a stratified probability sample of about 2,000 member banks. Within each Federal Reserve District all member banks were classified by volume of total deposits and, in some cases, further subclassified by geographic region within the District, population of the place of business, or the ratio of business loans to total assets or total deposits. The sample included all banks with deposits of over \$50 million and a declining proportion of each smaller size class. Sample banks within strata generally were selected by use of a table of random numbers. Banks with deposits of over \$100 million reported on all business loans of \$1,000,000 or more and on a systematic sample of every sixth of their smaller loans (although a smaller percentage was permitted for a few banks with unusually large numbers of business loans). Banks with deposits of \$10-\$100 million reported on all loans of \$100,000 or more and on every sixth loan under \$100,000. Banks with deposits of \$10 million or less reported on all their business loans.

The survey form was mailed to the respondent banks, accompanied by a letter from an official of the Reserve Bank in the District explaining the purposes of the survey and requesting their cooperation. Personal calls were also made on some or all of the sample banks by representatives of the Reserve Banks in some districts. Banks were instructed to fill in the information as of October 5, 1955, and return the forms to the Federal Reserve Bank by October 24. Mail and telephone follow-up procedures generally were used in case of nonresponse. Reports were received from 95 percent of the banks in the sample. The information was edited, coded and transferred to punched cards at the Reserve Banks, and the cards then sent to Washington where the information was put on magnetic tape for centralized processing by electronic computer.

First results of the survey were published in the April issue of the *Federal Reserve Bulletin*, and more detailed analyses of special aspects of bank lending to business will be presented in later issues of the Bulletin.

—JAMES B. ECKERT,
*Chief, Banking Section,
Division of Research and Statistics,
Board of Governors of the Federal
Reserve System*

Continued on page 25

THE ROLE OF STATISTICS IN SHAPING ECONOMIC POLICY*

RICHARD BOLLING

United States Congress

Mr. Chairman, President Parmelee, members of the Washington Statistical Society, and guests—I am most grateful for this invitation to bring to you my views on a subject which some of my colleagues in the Congress may think is fast becoming an obsession with me—the importance of *The Role of Statistics in Shaping Economic Policy*. And I am grateful, too, for the opportunity to express once again my thanks to the many members of your craft who have so often taken time from busy lives to come before the Joint Economic Committee or one of its subcommittees.

Basically *The Role of Statistics in Shaping Economic Policy* can be little different than the role of statistics in any other kind of decision-making. We are dealing essentially with a branch of scientific method. This particular branch is concerned with problems capable of being answered to some degree by numerical information—that is, information obtained by counting or measuring. It makes little difference whether we are making fish counts for a biological study or surveying hours of work in an industrial plant. The role of statistics and statisticians, it seems to me, is to first select the kind of information which will be needed for policy making, then to direct the proper and efficient collection and processing of that information and, finally, to interpret the results. In interpreting these results, especially where they are based on partial data, the statistician is expected to apply principles and techniques which let the layman use the findings with comforting assurance, and perhaps even abandon. This process is described sometimes as providing a method for making wise decisions in the face of uncertainty.

I doubt if, barring declarations of war, there is any place where a method for making wise decisions in the face of uncertainty is needed more than in economic policy-making. Especially is this true of government economic policy-making, which is probably the first area where statistics were used as a tool or guide. That the word "statistics" is related to the word "state" is, as all of you know, not a coincidence. Our earliest statistics were collected for the one purpose of providing legislators and government administrators with data for

managing the affairs of the state. These were series dealing with such subjects as population, taxes, taxable property and foreign trade.

In this connection I like to recall the delight with which Senator O'Mahoney used to point out to his colleagues that the interest of national governments in adequate programs of social and economic statistics was not as new as it might seem. On Washington's Birthday the Senator would quote from a wonderful letter from our first President to Sir John Sinclair commending him for the statistical studies he had under way in Scotland. John Sinclair, as you will recall, was the man who in 1791 set up a very comprehensive system of Statistical Accounts in that country, statistics which were based on a 200-question schedule sent to each of the nation's 850 Parish Ministers. In a letter dated March 15, 1793, George Washington wrote:

"I cannot but express myself highly pleased with the undertaking in which you are engaged, and give my best wishes for its success. I am full persuaded, that when enlightened men will take the trouble to examine so minutely into the state of society, as your inquiries seem to go, it must result in greatly ameliorating the condition of the people, promoting the interests of civil society, and the happiness of mankind at large. These are objects truly worthy the attention of a great mind and every friend to the human race must readily lend his aid towards their accomplishment."

By the twentieth century persons concerned with making public and private policy in economics had available scattered continuous series which generally were used to provide a basis for each person's or industry's own kind of "business barometer." But it always comes as somewhat of a surprise to me to realize that out of the statistical series which are used so widely today—and we publish over a hundred in our monthly *Economic Indicators*—most of them were not collected at all only two decades ago and those that were available were collected at wide intervals. Before 1929, for example, neither the Federal Government nor businessmen had anything like our present series on national income, gross national product, and their components. Even the consumers price index, upon which we rely for much of our understanding of what is going on in the economy, was, in 1929, computed just twice a year and then with a very substantial lag between the collection and the publication of the data.

* Mr. Bolling, Representative from Missouri, is chairman of the Subcommittee on Economic Statistics of the Joint Committee on the Economic Report. This talk was given at the annual dinner meeting of the Washington Statistical Society, January 23, 1956.

Such basic statistics as the total money supply, for which we now have preliminary data weekly and substantially complete data within the month, were not available until after a three months' lag. The statistics on consumer credit were not established until 1942. Reports on developments in the labor force, employment and unemployment statistics, which we all watch closely today and which subcommittees of the Joint Economic Committee have been making strenuous efforts to improve, were, for all practical purposes, not available before the Great Depression.

The improvements in statistics for economic policy in the last twenty years have done much to make realistic the national goals of "maximum employment, production, and purchasing power" which are set in the Employment Act of 1946. The Joint Economic Committee which was one of the two major new agencies established by the Act, recognized almost as soon as it was established that it could not make the economic decisions it would need to under the Act without having increasingly adequate economic information. The Committee was quick to recognize also that the responsibility for decision-making in a sound free-enterprise economy is broadly based on and more often rests with the individual consumer, businessman, labor leader, or farmer than with government. Decision-making in the area of economic policy in peacetime is, and should be, largely decentralized in an economy such as ours.

It is this very decentralization which placed on government an obligation for insuring that the statistics it collects are not only accurate and properly presented but are of the widest usefulness. As the distinguished head of your national organization emphasized in his presidential address, much of our success in handling the two recessions since the end of World War II could not have been achieved without good statistical records and good analysis.

In interesting contrast is the experience of the British government which was reported to me when I was in England last fall. I talked with a man who was concerned, long before the Government indicated an awareness of it, that they were going to have the inflation which they have been experiencing in the last months. He felt very strongly that if they had had a reasonably good series on business investment, they could have caught the trend at a time which would have been both objectively and politically more convenient for the Government to take action. And I understand that the Government in the United Kingdom has now undertaken to fill that gap with a series on business investment.

This reminds me to make the point that when we are talking about statistics which help shape economic policy in this country, we are talking not only about our own series but must include the statistics of other

countries as well. Many of our judgments as to the success or failure of our programs in the cold war have to be based on our analysis of statistics collected and processed in other countries. The Subcommittee on Foreign Economic Policy devoted an entire hearing to this subject, including our own foreign trade figures. Our feeling about the significance of statistics in this area is expressed in our first finding which reads:

"Adequate statistics for international comparisons and inter-government use are the key to scientific appraisal of needs for business and government decision making."

I think this may be the place to point out, too, that there is an obligation not only on government but also on private groups and individuals to improve the basis for their decision-making. Members of the Subcommittee on Economic Statistics were particularly impressed with this point during the recent hearings on the Federal Reserve Board Consultant Committee on Statistics of General Business Expectations. One of the recommendations of the consultant committee called for the immediate organization of a continuing private group interested in all branches of expectational economics. The subcommittee endorsed this thought in its own recommendations in a report which was later approved by the full committee for transmission to the Congress.

It may be of interest to know that work has already started on such a project. George Stigler, Chairman of the Universities-National Committee for Economic Research, reported to the Subcommittee on January 3 that their thirty cooperating universities were sponsoring a conference to examine the quality of the data on anticipations of businessmen and consumers.

The Subcommittee on Economic Statistics also recommended that "during 1956 a survey be made by the subcommittee of procedures and methods used by Government agencies in projecting Government revenues by the Treasury Department and the Bureau of the Budget, in preparing and disseminating outlook materials by the Department of Agriculture, in estimating the following year's construction activity by the Departments of Commerce and Labor, and in coordinating such work by the Council of Economic Advisers."

It is in this whole area of the preparation of quantitative economic projections that the role of economic statistics has one of the greatest contributions to make to policy-making. The development and use of tools which will enable us to quantify our assumptions in regard to the economic outlook in some rational way seems to me essential to any scientific policy review.

Having said this, however, I must recognize immediately as a legislator that there will be times when decisions affecting economic policy will be made on entirely different grounds—political, social, diplomatic.

Nor can we be sure that the assumptions we have made are all valid. The most complete and consistent statistical complex can never relieve us of thinking.

Regardless of these difficulties, if government and the private economy is to take seriously the objectives of the Employment Act, we are going to have to have reliable and prompt economic statistics, capable of the widest use and with the greatest possibilities for integration into a comprehensive system.

So far I have attempted to make clear that *The Role of Statistics in Shaping Economic Policy* is no different than the role of statistics in shaping any other policy, that this role is historic and basic, that it is equally important in public and private economic policy-making, that it includes international as well as national considerations, and that it is essential in carrying out any program aimed at the continued stability and growth of the nation's economy.

We might look now at the significance attached to the role of economic statistics in shaping economic policy, as measured by current federal appropriations and next year's budget. If a little smugness is permissible, I might say it is easier to take such a look at the status of appropriations for economic statistics since the inclusion of Special Analysis I in the budget document. This is an innovation recommended by the Subcommittee on Economic Statistics in 1954 during Congressman Talle's chairmanship, and we were all gratified at its ready acceptance. It shows in a separate compilation the appropriations for major economic statistical programs, by broad subject areas and by agency.

According to Analysis I, final appropriations for fiscal year 1956 allowed increases totaling \$2,616,000 for current economic statistical programs, as compared with requested increases totaling \$4,722,000. Areas in which improvements are being made this year as a result of the increases allowed are statistics on employment and unemployment, agricultural marketing research, estimates of farmers' expenditures, crop and livestock estimates, and the economics of farm production. Funds were added by the Congress for additional work in agricultural economics and statistics for projects which had not been included in the budget request—a study of acreage diversion, a study of the price spread between the farmer and the consumer, and establishment of a crop-reporting program in Hawaii.

The Subcommittee found it most unfortunate that no funds were provided for better construction statistics but we were gratified by the extent of the Congress'

interest in the many programs where improvements were allowed. We are looking forward, both as a committee and as individual members of Congress, to supporting the improvements for fiscal 1957 which have just been proposed in the President's Budget, and are set forth in the budget document this year in Special Analysis J. According to that analysis, direct obligations for current statistical programs totaled \$27.8 million in the fiscal year 1955. The estimate of expenditures for fiscal 1956 is \$31.9 million and \$35.1 million has been requested for fiscal 1957. Again, for a bit of pointing-with-pride, many of the improvements requested for 1957 have come from recommendations made in the testimony of governmental, business and labor economists and analysts before the Joint Committee on the Economic Report, and in reports made by the Joint Committee. They include also specific suggestions made in the reports of the five committees of expert consultants established by the Federal Reserve Board, at the request of the Joint Economic Committee, to appraise certain statistical fields. We have asked the Bureau of the Budget to report particularly as to the progress of the actions taken during the year on the recommendations of these committees.

We shall do our best also to see that the members of Congress understand the need for these statistics but many of our colleagues will be looking to other sources for additional advice on these programs. I hope those of you who are from outside the government will feel an equal obligation to see that your managements are aware of the necessity for making clear to members of the appropriations committees concerned the use of and need for economic statistics—and I am sure you will.

As individual statisticians it will be up to many of you to see that the increasingly important role of economic statistics in shaping economic policy is justified. It will be up to you to come up with answers to the technical problems such as how we can be sure in our concept of the labor force that we are adequately taking account of shifts in the patterns of employment—a question, incidentally, which we raised in the Subcommittee Report. Upon you rests an obligation to see that the maximum efficient use is made of funds expended for statistical resources; that collection methods are sound and limits properly assessed and stated; that analysis is adequate and warning raised where warning is needed; and that the spirit which seeks and accepts new methods and improvements to existing methods is kept ever alive.

ON THE INTERPRETATION OF THE AGGREGATE SAVINGS RATIO*

ROBERT FERBER

University of Illinois

The savings ratio in national income analysis is defined as the proportion which, in a given period, savings constitutes of disposable personal income. The savings aggregate is defined as that part of disposable personal income not devoted to consumption expenditures, i.e., $Y - C$ in the usual terminology. The amount of savings, and the value of the savings ratio, are followed with keen interest as key indicators of consumer behavior as well as of funds available for investment, particularly in interpreting short-run cyclical fluctuations.

The pitfall in this interpretation is that all expenditures made for consumption purposes during a given period do not necessarily come out of disposable personal income for that period. Specifically, there are two other sources of funds for expenditure purposes — borrowing (B) and accumulation of savings from past periods, i.e., liquid assets (L). Expenditures can be made from any of these three sources of funds, and ideally one would have three consumption, or savings, ratios for each period — C_F , C_B , C_L , where C_i represents expenditures made out of financial source i .

In practice, however, a number of modifications are necessary in this theoretical scheme. Since it is as yet almost impossible to estimate the various C_i 's, they are combined into one aggregative variable. In the denominator of the usual savings-income ratio, the sources of finances, liquid assets, are omitted altogether, in part perhaps because expenditures out of liquid assets are presumably very small relative to other expenditures and liquid assets do not change much anyway over the short run, and in part because liquid assets, being a stock rather than a flow, are not included in the present national income accounting framework. Borrowing is also excluded from the denominator and, from the point of view of the national income accounts, for a good reason. It, too, has no place in these accounts, representing in effect savings borrowed from future periods for present consumption and hence is not a permanent addition to one's finances.

This exclusion of borrowing as a source of finances but the inclusion in consumption expenditures of outlays arising from borrowing is not unknown. At the same time, however, it is a factor which has received little attention in recent years, so little in fact that two of the U.S. Department of Commerce top analysts make no reference to it in a recent article examining fluctuations in the savings ratio during a period of substantial credit accumulation.¹ Yet it is precisely during such a period that temporal comparisons of consumption or savings ratios can be highly misleading, particularly as in the following statement:

"In the first half of 1954, personal consumption expenditures accounted for 92 cents out of every dollar of disposable personal income, whereas, in the first half of this year [1955] the amount was increased to 94 cents".²

Such a statement leaves the misleading implication that the expenditures referred to were made solely out of disposable income which, with substantial credit expansion underway, let alone the assets factor, they patently were not. Moreover, the direction of change noted in the statement is not substantiated by the facts, for the increase in credit accumulation during the first half of 1955 was large enough to account for the entire increase in the spending ratio noted above.³ To be sure, in an over-all sense the main implication is the same in either case: consumers exhibited a greater willingness to spend. But the *mechanism* through which this willingness takes place is of great importance both from the viewpoint of understanding and predicting business trends and from the viewpoint of policy formation. An increased tendency to spend not from current income but by borrowing more money has different ramifications and possible consequences than an increased tendency to spend out of current income.⁴

¹ Paradiso, L. J. and Clement Winston, "Consumer Expenditure-Income Patterns," *Survey of Current Business*, September 1955, pp. 23-32.

² *Ibid.*, p. 25.

³ Thus, the increase in instalment credit extended alone between the two periods is \$7.8 billion, at an annual rate, which is sufficient to account for the "increased" spending out of income if only two-thirds of it is translated into purchases.

⁴ For lack of data, we abstract from effects due to spending out of assets in this study.

* The author would like to express his appreciation to Don Streever for his helpful suggestions and to Robert Zaruba of the staff of the Bureau of Economic and Business Research of the University of Illinois for statistical assistance.

Although the two actions produce the same balance when all accounts are combined, the debt and asset structure of society are different, not to mention the differing implications for consumer behavior in the future.

It would seem, therefore, of some interest to attempt to adjust the savings ratio for expenditures made possible by borrowing. There are two ways of making such an adjustment, both ways seeking to place the numerator and the denominator of the savings ratio on comparable terms. These are:

1. Leave consumption expenditures untouched and add to disposable income the net change in consumer borrowing (N) during the period. The consumption ratio then becomes:

$$\frac{C}{Y + N}$$

and the savings ratio,

$$R_1 = \frac{(Y - C) + N}{Y + N}$$

This ratio approximates, in effect, the proportion of total purchasing power received during the period that is not spent for goods and services.

2. Deduct from consumption expenditures that portion made possible directly by consumer borrowing (C_b) retaining in the denominator of the ratio just disposable personal income. The consumption ratio is then:

$$\frac{C - C_b}{Y} = \frac{C_Y}{Y}$$

where C_Y represents expenditures made out of disposable personal income.

The savings ratio in this case,

$$R_2 = \frac{Y - C_Y}{Y}$$

approximates that part of disposable personal income not spent for goods and services during the given period.

Both of these alternative ratios obviously possess distinctive advantages and limitations for short-run analysis with reference to each other as well as to the savings ratio concept in current use.⁵ Let us see, therefore, how these alternative measures differ in practice.

The fluctuations in the savings ratio as ordinarily defined and in the two alternate definitions presented above are shown in Figs. 1 and 2 covering the postwar

⁵ It is perhaps needless to note that the estimates, C_i , represent expenditures made directly out of that particular source and make no allowance for indirect or "joint" effects such as expenditures out of one source triggered by the presence of funds from another source.

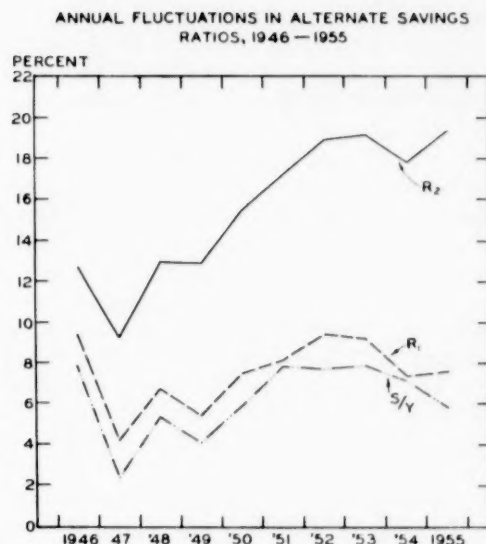


Figure 1

period, 1946-1955. Fig. 1 portrays the annual fluctuations in the three ratios, and Fig. 2 the quarterly fluctuations (based on seasonally-adjusted series). Estimates of the alternative ratios, R_1 and R_2 , were derived by employing the definitional equations set forth above, except for one modification in the case of R_2 . Consumption expenditures effected out of consumer borrowing during a given period were estimated as the amount of instalment credit extended during the period excluding 30 percent of personal loans. Noninstalment credit extended is omitted because the necessary data could not be obtained. This leaves us with the rather heroic assumption that instalment credit extended less 30 percent of personal loans approximates consumer expenditures made out of credit.

Such an assumption is, of course, a debatable one and would seem to be a highly hazardous one as well. On

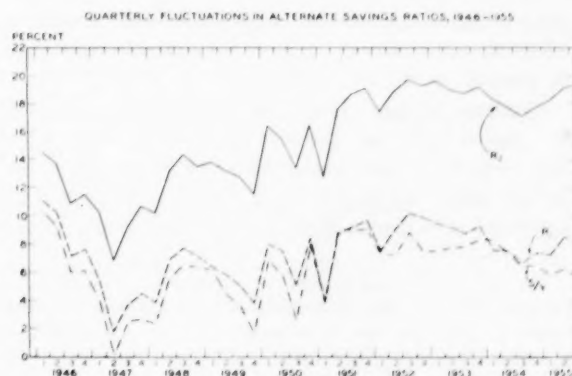


Figure 2

second thought, however, it may actually turn out to be not far from the truth, at least insofar as the fluctuations of the series being estimated is concerned. For one thing, noninstalment credit is not as volatile as instalment loans and is considerably smaller than the latter. This has especially been true for the great credit expansion of the past few years. More than 75 percent of all credit outstanding in mid-1955 was of the instalment variety, and this proportion was undoubtedly larger for total credit *extended* since many single-payment loans are made for several months or a year at a time. Then, too, a large proportion of noninstalment credit is extended for financial transactions (brokers' loans, refinancing, etc.), so that on balance only a very small part of all purchases made with the aid of credit are likely to originate with noninstalment loans. Reducing personal instalment loans by 30 per cent is a makeshift device to allow for that unknown portion of such loans made for purposes other than consumption expenditures. To judge by what little information is available, this proportion is not unreasonable (though it is recognized that this figure may fluctuate inversely to the business cycle).⁶ At the same time, it would not be surprising if the estimates presented here of consumer expenditures effected directly out of borrowing are too low, because of the necessary exclusion of all forms of noninstalment credit extended. We can only conjecture that this bias is likely to remain more or less constant with reference to the intertemporal comparisons under consideration.

With the above limitation in mind, let us turn to an examination of the two charts. Perhaps the most striking feature of both of them is the much higher level of the savings ratio that is obtained when total consumption expenditures are reduced by that portion made out of borrowed funds. The resultant savings ratio, R_2 , indicates that the amount saved out of current available funds has varied generally between 15 and 17 percent during the past few years and in some quarters has exceeded 18 percent. Considering the underestimation bias in expenditures based on credit, it is quite likely that in some quarterly periods of recent years funds not spent for goods and services may have amounted to more than 20 percent of the available total!

Needless to say, this contrasts sharply with the 6-9 percent savings ratios to which we have been accustomed in recent years. Although money borrowed at one time has to be repaid in later periods, this nevertheless indicates that at least in the first postwar

decade a far greater cushion of reserve purchasing power existed than most people realized. In the first half of 1955, for example, personal savings did not account for 6 cents out of every dollar of disposable income, as has been hitherto alleged, but rather for more than 15 cents out of every dollar of disposable income! This figure will of course decline sharply once credit retraction gets underway and borrowing drops off, but the fact remains that insofar as interpreting the current scene and the short-run business outlook are concerned, the alternate savings ratio, R_2 , presents an entirely different picture than does the usual savings-income ratio.

On the other hand, if we consider funds not spent for goods and services in relation to income-plus-other-funds-received during the period, the resulting ratio (R_1) is much closer in magnitude to the orthodox savings-income ratio although generally somewhat larger. In some periods, the margin has been substantial, indicating on this basis also a much larger cushion of reserve purchasing power to have existed than would otherwise have been supposed.

The fluctuations of the orthodox ratio and R_1 are in general similar, but this is not so true when the orthodox ratio is compared with R_2 .⁷ Even in the former case, however, there are notable differences. Thus, in 1952 the savings-income ratio declined while both R_1 and R_2 moved up sharply. In 1953, the savings-income ratio moved up, as did R_2 , but the proportion that was not spent out of all available funds during the year declined. In 1954 the three ratios moved in the same direction, but the savings-income ratio declined only slightly while the other two ratios dropped sharply. The period, 1954-55, provides a particularly striking illustration of divergent movements in the ratios (Fig. 2). Between the third quarter of 1954 and the middle of 1955, the savings-income ratio declined from 6.5 percent to 6.2 percent. However, the proportion of all available funds withheld from consumption rose during most of this period from 6.8 percent to 8.4 percent, while the proportion saved out of disposable income rose from 14.5 percent to 16.8 percent. In other words, instead of declining, the savings rate actually increased during this period by both of the other concepts.

Thus, it appears from an empirical point of view that the alternate savings ratios proposed differ at times appreciably both in magnitude and direction from the savings-income ratio customarily used in economic analysis, and that the latter considered alone can present a misleading picture of the true state of affairs.

⁶ A recent study found that of a sample of personal loans made in 1950 and 1951, those intended for financial purposes constituted 31.3 per cent for consumer finance companies, 29.4 per cent for commercial banks, and 19.7 per cent for credit unions. Robbins, W. David, *Consumer Instalment Loans*, Columbus, Ohio: Ohio State University, 1955, p. 87.

⁷ The coefficients of determination between the savings-income ratio and R_1 are 0.89 on the quarterly basis and 0.91 on the annual basis. Those between the savings-income ratio and R_2 are 0.57 quarterly and 0.50 annually.

Inasmuch as the alternate ratios appear to have at least as much to commend them as the customary savings-income ratio, revision of current empirical concepts in this area would seem highly desirable. Such a revision might well have as its starting point the notion that the ratios of savings and expenditures to income even in the aggregate is not a simple one that can be presented in one figure, but rather contains a number of complex and interacting facets all of which may be highly pertinent to business cycle analysis and which can only be brought out by computing and studying several different ratios each designed for a specific purpose. These ratios might include the following:

1. The proportion of total funds received during a given period not spent for goods or services during that period. This is the ratio, R_1 , and provides, as noted before, a useful measure of reserves accumulated during the given period, some of which however have to be paid back in future periods.

2. The proportion of total disposable income received during a given period not devoted to consumption expenditures during the period. This is the ratio, R_2 , and not the customary savings-income ratio with which it appears to be so often confused. In measuring the

extent to which savings are made out of income, it has to be recognized that R_2 makes no allowance for the partially-offsetting use of credit.

3. The proportion which personal savings constitute of total disposable personal income. This, which is the orthodox savings-income ratio, and R_2 serve to complement each other in that the former includes purchases made from consumer credit and the latter does not. As mentioned previously, such purchases are not always offsetting, as is implicitly assumed in the orthodox ratio.

It is worth noting at this point that all three of these ratios will be biased downward in practice because part of the expenditures attributed to income sources will actually have been made out of liquid assets. At the present state of knowledge, this appears to be an unavoidable bias, the effect of which unfortunately is likely to vary over the course of the cycle.

The three savings ratios listed above will, needless to say, not supply a complete picture of the savings situation, and need to be used in conjunction with the relevant aggregates. Their joint adoption, however, will undoubtedly contribute to a far more realistic appraisal of aggregate savings-expenditure patterns than is possible with the single ratio in current use.

STATISTICAL CONSULTANTS

Atomic power research and development center is starting a statistical group to serve as a consulting body to chemists, metallurgists, physicists, and engineers who are designing nuclear power reactors.

Send resume of education
and experience to:

Mr. A. M. Johnston
Dept. C-34
Westinghouse Bettis Plant
P. O. Box 1468
Pittsburgh 30, Penna.

Qualifications: A broad theoretical background in statistics and a thorough knowledge of experimental designs and their uses. In addition, applicant must be able to communicate effectively with technical personnel in the Physical Sciences.

Education: Minimum educational background required is the Master of Science Degree.

Location: Bettis Plant in Pittsburgh's suburban South Hills.

Positions are permanent. Real security with pension, insurance and family hospitalization programs. Unusual opportunity for personal and professional growth.

NOTE: The program listed below is accurate up to the time this issue went to press. However, changes between now and the time of the annual meeting are inevitable. Therefore, please be sure that you consult your official program (which will be issued to you at the time you register for the annual meeting) for exact information.

Program of the 116th Annual Meeting of the AMERICAN STATISTICAL ASSOCIATION

Sheraton-Cadillac Hotel, Detroit, September 7-10, 1956

FRIDAY, SEPTEMBER 7

10:00 A.M. 12:00 Noon

A CRITICAL APPRAISAL OF LONG-RANGE ECONOMIC PROJECTIONS

Business and Economic Statistics Section

Chairman: JAMES W. KNOWLES, *Joint Committee on the Economic Report*

Papers: "Relation of Structure and Assumptions to Purpose in Making Economic Projections" by JAMES W. KNOWLES, *Joint Committee on the Economic Report*
 "The Coordination of Supply and Demand Assumptions: Interrelations of Product Mix, Capital Investment, and Productivity in Long-Range Economic Projections" by LOUIS WEINER, *Federal Reserve System*
 "Prices and Factor Returns Assumptions in Long-Range Economic Projections" by MARVIN HOFFENBERG, *RAND Corporation*

Discussion: REX F. DALY, *Department of Agriculture*

10:00 A.M. 12:00 Noon

COVARIANCE ANALYSIS—I

Biometric Section—Institute of Mathematical Statistics—Biometric Society (ENAR)

Chairman: A. W. KIMBALL, *Oak Ridge National Laboratory*

Papers: "Elements of Covariance" by D. B. DELURY, *Ontario Research Foundation*
 "Tests of Significance in Analysis of Covariance" by H. FAIRFIELD SMITH, *North Carolina State College*

Discussion: OSCAR KEMPTHORNE, *Iowa State College*

10:00 A.M. 12:00 Noon

HOW TO APPRAISE LIABILITIES AND OPPORTUNITIES IN EMPLOYMENT STABILIZATION AND SUPPLEMENTARY UNEMPLOYMENT BENEFITS

Business and Economic Statistics Section

Chairman: (To be announced)

Papers: (Title to be announced) SEYMOUR HARRIS, *Harvard University*

12:00 Noon Luncheon

STOCK MARKET OUTLOOK

General Session—Business and Economic Statistics Section—Federation of Financial Analysts Societies

Chairman: ROBERT J. WILKES, *Scudder, Stevens & Clark*

Papers: "The Outlook for Shares of Chemical Companies" by JEREMY C. JENKS, *Cyrus J. Lawrence & Sons*
 "The Outlook for Bank Shares" by GILBERT PALMER, *National City Bank of Cleveland*
 "The Outlook for Shares of Utility Companies" by EDWARD M. SPENCER, *Detroit Edison Company*
 "The Outlook for Stock Prices" by M. DUTTON MOREHOUSE, *Brown Brothers, Harriman & Co.*

1:30 3:30 P.M.

PLANNING FOR THE 1960 CENSUS

Social Statistics Section—American Sociological Society—Rural Sociological Society

Chairman: PHILIP M. HAUSER, *University of Chicago*

Papers: "Procedural Plans" by MORRIS HANSEN, *Bureau of the Census*
 "Population Census Plans" by HOWARD BRUNSMAN, *Bureau of the Census*
 "Housing Census Plans" by WAYNE DAUGHERTY, *Bureau of the Census*

Discussion: J. T. MARSHALL, *Dominion Bureau of Statistics*
 OTIS DUDLEY DUNCAN, *Univ. of Chicago*
 ROBERT L. SEIDNER, *Chicago American*

Friday, September 7

2:00-4:00 P.M.

CRITERIA FOR EVALUATING CONSUMER AND REAL ESTATE CREDIT

Business and Economic Statistics Section

Chairman: LAWRENCE H. SELTZER, *Wayne University*

Papers: "Criteria for Consumer Credit" by SIDNEY E. ROLEE, *C.I.T. Financial Corporation*
"Criteria for Real Estate Mortgage Credit" by ROBINSON NEWCOMB, *Robinson Newcomb Associates*

Discussion: ANDREW T. COURT, *General Motors Corporation*
PAUL McCracken, *University of Michigan*

2:00-4:00 P.M.

DEVELOPMENTS IN LATENT STRUCTURE ANALYSIS

Social Statistics Section

Chairman: LEO KATZ, *Michigan State College*

Papers: "Some New Models in Latent Structure Analysis" by P. F. LAZARSFELD, *Columbia Univ.*
"Sampling Theory and Sampling Experience in Latent Structure Analysis" by T. W. ANDERSON, *Columbia Univ.* and R. O. CARLETON, *Puerto Rico Planning Board*

Discussion: A. C. MADANSKY, *Univ. of Chicago*
BERT F. GREEN, *Mass. Inst. of Technology*

2:00-4:00 P.M.

COVARIANCE ANALYSIS—II

Biometric Section—Institute of Mathematical Statistics—Biometric Society (ENAR)

Chairman: (To be announced)

Papers: "Covariance Analysis with Unequal Subclass Numbers" by WALTER T. FEDERER, *Cornell University*
"The Analysis of Covariance for Incomplete Block Designs" by MARVIN ZELEN, *National Bureau of Standards*
"Group Comparisons and Analysis of Variance and Covariance in Cluster Sampling" by H. O. HARTLEY, *Iowa State College*

Discussion: JOHN W. TUKEY, *Princeton University*

4:00 P.M.

SOCIAL STATISTICS SECTION—BUSINESS MEETING

4:00-6:00 P.M.

APPLICATIONS OF ELECTRONIC COMPUTERS IN STATISTICS

Section on Physical and Engineering Sciences—Biometric Society (ENAR)—Institute of Mathematical Statistics

Chairman: M. A. WOODBURY, *New York University*

Papers: "Experiences with SEAC" by J. M. CAMERON, *National Bureau of Standards*
"How to Control the Digital Computer" by R. W. HAMMING, *Bell Telephone Laboratories*
"Sampling Experiments" by D. TEICHROEW, *National Cash Register Company*

4:00-6:00 P.M.

FLOW OF FUNDS DATA AS A TOOL OF ECONOMIC ANALYSIS

Business and Economic Statistics Section

Chairman: THEODORE O. YNTEMA, *Ford Motor Company*

Papers: (Title to be announced), by GEORGE HOROWITZ, *National Bureau of Economic Research*
(Title to be announced), by STEPHEN HANDFIELD-JONES, *Bank of Canada*
(Title to be announced), by E. T. WEILER, *Purdue Univ.*

Discussion: STANLEY SIGEL, *Federal Reserve System*
KENNETH BOULDING, *Univ. of Michigan*

8:00-10:00 P.M.

SOME THEORETICAL ASPECTS OF SAMPLE SURVEYS

General Session—Institute of Mathematical Statistics

Chairman: (To be announced)

Papers: "Estimation of Variances and Composite Estimation Procedures" by JOSEPH STEINBERG, *Bureau of the Census*
"Variances of Ratios and Their Differences in Multistage Samples" by LESLIE KISH and IRENE HESS, *University of Michigan*
"Unbiased Ratio Estimators and Their Variances" by LEO GOODMAN, *Univ. of Chicago*, H. O. HARTLEY, *Iowa State College* and A. ROSS, *Univ. of Pittsburgh*
"Designs with Unequal Probability Selection" by D. HORVITZ, *North Carolina State College*

Friday, September 7

8:00-10:00 P.M.

1954 CENSUS RESULTS

Business and Economic Statistics Section

- Chairman:** ROBERT W. BURGESS, *Bureau of the Census*
- Papers:** "The 1954 Census of Agriculture" by CONRAD TAEUBER, *Bureau of the Census*
"The 1954 Censuses of Industry and Trade" by HOWARD C. GRIEVES, *Bureau of the Census*
"Noteworthy Aspects of Statistical Methods and Computation Techniques in the 1954 Censuses" by MORRIS H. HANSEN, *Bureau of the Census*
- Discussion:** VERGIL D. REED, *J. Walter Thompson Company*
RALPH J. WATKINS, *Dun & Bradstreet, Inc.*

SATURDAY, SEPTEMBER 8

8:30 A.M.

SECTION ON TRAINING—BUSINESS MEETING

9:00-11:00 A.M.

DEVELOPMENT OF AN INTEGRATED FEDERAL STATISTICAL PROGRAM

Business and Economic Statistics Section

- Chairman:** HENRY O. TALLE, *United States Congress*
- Papers:** "The Philosophy of an Integrated Federal Statistical Program" by RAYMOND BOWMAN, *Office of Statistical Standards*
"Problems in Developing an Integrated Federal Statistical Program" by EWAN CLAGUE, *Department of Labor*
EDWARD F. DENISON, *Department of Commerce*
RALPH A. YOUNG, *Federal Reserve System*
- Discussion:** STANLEY RUTTENBERG, *AFL-CIO*
LESTER S. KELLOGG, *Deere and Company*
CHARLES SCHMIDT, *National Bank of Detroit*

9:00-11:00 A.M.

DESIGN AND ANALYSIS OF ANIMAL FEEDING EXPERIMENTS

Biometric Society (ENAR)—Biometric Section, ASA

- Chairman:** (To be announced)
- Papers:** "Control of Error Variance in Swine Feeding Experiments" by GORDON C. ASHTON, *Iowa State College*
(Title to be announced), by PAUL G. HOMEYER, *Iowa State College*

9:00-11:00 A.M.

STATISTICS IN MENTAL HEALTH

Social Statistics Section

- Chairman:** (To be announced)
- Papers:** (To be announced)

9:00-11:00 A.M.

INDUSTRIAL EXPERIMENTATION

Section on Physical and Engineering Sciences

- Chairman:** ALFRED LIEBERMAN, *Bureau of Ships*
- Papers:** "Some Aspects of Statistical Research in Industry" by R. ROBERT HOOKE, *Esso Research Laboratories*
"Problems in Life Testing" by WILLIAM B. ALLEN, *RCA Laboratories*
"Random Assignments in Experimentation" by FRANK E. SATTERTHWAITE, *Rath and Strong*

11:00 A.M.

BIOMETRIC SECTION—BUSINESS MEETING

11:00 A.M.

MEETING OF CHAPTER LIAISON OFFICERS—SPES

12:00 Noon Luncheon

GOLDEN ANNIVERSARY OF CENSUS TRACTS IN THE U. S. AND CANADA—1906-1956

General Session

- Chairman:** (To be announced)
- Papers:** "Dr. Walter Laidlaw's Vision—Early Years, 1906-1926" (Speaker to be announced)
"A Period of Great Growth and Development, 1926-1946" by HOWARD WHIPPLE GREEN, *Cleveland Health Council*
"A Period of Expanding Use of Tract Data, 1946-1956" by A. ROSS ECKLER, *Bureau of the Census*

Saturday, September 8

2:00-4:00 P.M.

CENSUS TRACT MEETING

General Session

- Chairman:** HOWARD WHIPPLE GREEN, *Cleveland Health Council*
Papers: "Tract Tabulations for the 1960 Census" by HOWARD BRUNSMAN, *Bureau of the Census*
Discussion: Census Tract Key Persons

2:00-4:00 P.M.

METHODOLOGY OF MORBIDITY SURVEYS

Social Statistics Section—Biometric Society (ENAR)

- Chairman:** FELIX MOORE, *U. S. Public Health Service*
Papers: (Title to be announced), by THEODORE WOOLSEY, *U. S. Public Health Service*
(Title to be announced), by JACK ELINSON, *National Opinion Research Council*

2:00-4:00 P.M.

CONSULTING EXPERIENCE AS PART OF A STATISTICS CURRICULUM

Section on Training

- Chairman:** PAUL HOMMEYER, *Iowa State College*
Papers: (To be announced)

2:00-4:00 P.M.

TRENDS TOWARD STABILITY OR INSTABILITY IN THE AMERICAN ECONOMY

Business and Economic Statistics Section

- Chairman:** LOUIS PARADISO, *Department of Commerce*
Papers: (Title to be announced), by PAUL W. McCracken, *University of Michigan*
(Title to be announced), by HERBERT STEIN, *Committee for Economic Development*
Discussion: MARTIN GAINSBURGH, *National Industrial Conference Board*
DAVID LUSHER, *Council of Economic Advisers*

2:00-4:00 P.M.

INDUSTRIAL BIOLOGY—SCREENING—I

Biometric Section—Biometric Society (ENAR)

- Chairman:** SPENCER M. FREE, JR., *Smith, Kline & French Laboratories*
Papers: "Screening Problems in the Pharmaceutical Industry" by CHARLES W. DUNNETT, *Lederle Laboratories*
"Screening Problems in the Food Industry" by MAVIS B. CARROLL, *General Foods Corporation*
"Screening Problems in Biochemical Research" by HARRY SMITH, JR., *Procter and Gamble Company*

4:00-6:00 P.M.

INDUSTRIAL BIOLOGY—SCREENING—II

Biometric Section—Biometric Society (ENAR)

- Chairman:** SPENCER M. FREE, JR., *Smith, Kline & French Laboratories*
Panel: WILLIAM S. CONNOR, *National Bureau of Standards*
CUTHBERT DANIEL, *Consultant Statistician, New York City*
JOHN W. TUKEY, *Princeton Univ. and Bell Telephone Laboratories*

4:00-6:00 P.M.

FORECASTING THE DEMAND FOR DURABLE GOODS

Business and Economic Statistics Section—Econometric Society

- Chairman:** IRWIN FRIEND, *University of Pennsylvania*
Papers: "Forecasting Inventories from Businessmen's Expectations" by MILLARD HASTAY, *National Bureau of Economic Research*
"Demand Relationships for Automobiles and Consumer Durables" by HENDRIK S. HOUTHAKKER, *Stanford Univ.*
"Forecasting Plant and Equipment Expenditures from Businessmen's Expectations" by VITO NATRELLA, *Securities and Exchange Commission*
"Variations in Income Elasticities of Consumer Durables Among Countries and Social and Economic Groups" by IRVING B. KRAVIS, *Univ. of Pennsylvania*

4:00-6:00 P.M.

PRODUCTION AND INVENTORY CONTROL

Section on Physical and Engineering Sciences

- Chairman:** NORMAN BARISH, *New York University*
Papers: (Title to be announced) by GIFFORD SYMONDS, *Esso Research Laboratories*
"Cycling in Inventory Control" by I. R. SAVAGE, *Stanford University*

Saturday, September 8

4:00-6:00 P.M.

MATHEMATICAL AND STATISTICAL TRAINING OF SOCIAL SCIENTISTS

Section on Training—American Sociological Society

Chairman: PAUL IRICK, *Purdue University*

Papers: "A New Freshman Course: Introduction to Finite Mathematics" by G. L. THOMPSON, *Dartmouth College*
"The Introductory Course in Statistics for Sociologists" by DANIEL O. PRICE, *University of North Carolina*

4:00-6:00 P.M.

CHANGING HOURS OF WORK: THE TRENDS AND THEIR ECONOMIC IMPLICATIONS

Social Statistics Section

Chairman: GEORGE P. SHULTZ, *Mass. Inst. of Technology*

Papers: "Patterns of Working Hours in American Industry" by SEYMOUR L. WOLFBEIN, *Bureau of Labor Statistics*
"Some Economic Consequences of Long-Term Changes in Working Hours" by CHARLES SCHULTZE, *Council of Economic Advisers*

Discussion: MARK L. KAHN, *Wayne University*
JAMES STERN, *UAW, AFL-CIO*
CEDRIC WOLFE, *Metropolitan Life Insurance Co.*

8:00-10:00 P.M.

ACCURACY OF STATISTICAL DATA

General Session

Chairman: STUART A. RICE, *Stuart Rice Associates*

Papers: "What Information About the Accuracy and Other Characteristics of Data Should the Producers of Statistics Give to Users?" by FREDERICK F. STEPHAN, *Princeton University*
"Enumeration Methods and Accuracy of Response" by MORRIS HANSEN and CONRAD TAEUBER, *Bureau of the Census*

SUNDAY, SEPTEMBER 9

8:30 A.M. Breakfast

MEETING OF CHAPTER PRESIDENTS AND SECRETARIES AND DISTRICT REPRESENTATIVES

American Statistical Association

8:30 A.M. Breakfast

BUSINESS AND ECONOMIC STATISTICS SECTION—BUSINESS MEETING

10:00 A.M.-12:00 Noon

SOME MAJOR GAPS IN BUSINESS AND ECONOMIC STATISTICS

Business and Economic Statistics Section

Chairman: WILLIAM SHAW, *E. I. du Pont de Nemours and Company*

Papers: (Title to be announced), by CLARENCE LONG, *Johns Hopkins University*
(Title to be announced), by PATRICK LOFTUS, *United Nations*

Discussion: RUTH MACK, *National Bureau of Economic Research*
STANLEY LEBERGOTT, *Office of Statistical Standards*

10:00 A.M.-12:00 Noon

APPLICATIONS OF STOCHASTIC PROCESSES

Biometric Section—Biometric Society (ENAR)—Institute of Mathematical Statistics

Chairman: (To be announced)

Papers: "The After-History of Pulmonary Tuberculosis, A Stochastic Model" by DAVID W. ALLING, *Herman W. Biggs Memorial Hospital*
"The Application of Stochastic Processes to the Kinetics of Enzyme Action" by ANTHONY F. BARTHOLOMAY, *Harvard School of Public Health and Harvard University Medical School*

10:00 A.M.-12:00 Noon

STATISTICS IN THE AUTOMOTIVE INDUSTRY

Section on Physical and Engineering Sciences

Chairman: LAWRENCE R. HAFSTAD, *General Motors Corporation*

Papers: (To be announced)

Sunday, September 9

2:00-4:00 P.M.

THE IMPACT OF ELECTRONIC COMPUTING ON BUSINESS AND ECONOMIC STATISTICS AND STATISTICIANS

Business and Economic Statistics Section

Chairman: RAYMOND T. BOWMAN, *Office of Statistical Standards*

Papers: "Electronic Potentials for Generating, Analyzing, and Presenting Economic Data" by FRANK R. GARFIELD and MAURICE H. SCHWARTZ, *Federal Reserve System*

"Electronic Warehouse Inventory Control" by WILLIAM R. JACK, *Chrysler Corp.*
Discussion: JOHN W. BOATWRIGHT, *Standard Oil Co. (Indiana)*

2:00-4:00 P.M.

NORMALIZING TRANSFORMATIONS APPLIED TO THE COMMONER TESTS OF SIGNIFICANCE

Institute of Mathematical Statistics—Biometric Society (ENAR)—ASA

Chairman: (To be announced)

Paper: "Normalizing Transformations Applied to the Commoner Tests of Significance" by JOHN WISHART, *Univ. of Cambridge*

2:00-4:00 P.M.

TRAINING IN COMPUTATIONAL METHODS—I: THE TRAINING AND RESEARCH PROGRAM ADOPTED AT CERTAIN UNIVERSITIES

Section on Training

Chairman: (To be announced)

Papers: "Basic Instruction in Statistical Computations" by PAUL S. DWYER, *University of Michigan*

"Organization and Supervision of the Programming of Research Computations" by CARL F. KOSSACK, *Purdue University*

"Courses in Programming for High Speed Computers" by F. M. VERZUH, *Massachusetts Institute of Technology*

2:00-4:00 P.M.

METHODOLOGY IN ATTITUDE RESEARCH

Social Statistics Section

Chairman: ROBERT N. FORD, *Bell Telephone Laboratories*

Papers: "Experiences with UNIVAC Processing of Questionnaire Data" by R. K. HARTER, *American Telephone & Telegraph Co.*

"Estimating the Variance of Trend Differences from Successive Surveys Affected by Anonymity and Partial Sample Turnover" by FREDERICK F. STEPHAN, *Princeton University*

"Results of a Comparison of The Guttman Scaling Technique and Factor Analysis of Attitude Questions" by P. J. SIEGMANN, *Bell Telephone Laboratories*

4:00-6:00 P.M.

CONTRIBUTED PAPERS—I

General Session

Chairman: (To be announced)

Papers: (To be announced)

4:00-6:00 P.M.

MEASURING THE POTENTIALS OF GROWTH IN GREAT LAKES AREA FOLLOWING COMPLETION OF ST. LAWRENCE SEAWAY

Business and Economic Statistics Section

Chairman: DONALD E. CHURCH, *Bureau of the Census*

Papers: "Industrial Situation" by BAY E. ESTES, *United States Steel Corporation*

"Agricultural Situation" by WILLIAM DACHLER, *Department of Agriculture*

"Port Situation" by STERLING ST. JOHN, JR., *Port of Detroit Commission*

"Special Factors in United States Situation" by ROBERT C. KING, *Maritime Administration*

"Special Factors in the Canadian Situation" by G. A. RICHARDSON, *Dominion Bureau of Statistics*

4:00-6:00 P.M.

CREATIVE MANPOWER SHORTAGE

Social Statistics Section and Section on Training

Chairman: (To be announced)

Papers: (Title to be announced) by SAMUEL M. BROWNELL, *U. S. Office of Education*

Sunday, September 9

4:00-6:00 P.M.

FINANCIAL IMPLICATIONS OF LONG-TERM GROWTH

Business and Economic Statistics Section

Chairman: RALPH A. YOUNG, *Federal Reserve System*

Papers: (Title to be announced), by SHERWIN BADGER, *New England Mutual Life Insurance Company*
(Title to be announced), by EDWARD SHAW, *Stanford Univ.*

8:00-10:00 P.M.

PRESIDENTIAL ADDRESS—GERTRUDE M. COX

General Session

10:00 P.M.

INFORMAL PARTY

MONDAY, SEPTEMBER 10

9:00-11:00 A.M.

TRAINING IN COMPUTATIONAL METHODS—II: THE COMPUTATIONAL TASKS ARISING AT COMPUTING CENTERS AND TRAINING GIVEN TO PERSONNEL

Section on Training

Chairman: (To be announced)

Papers: "The Requirements of Scientific Computations Arising in Government Computing Centers" by J. CAMERON and M. ABRAMOWITZ, *National Bureau of Standards*
"The Organizational Problems Arising in the Bureau of the Census Large Scale Statistical Computations" by J. F. DALY, *Bureau of the Census*
"Computational Problems in Industrial Research and Development and Training Given to Personnel" by H. R. J. GROSCH and D. L. SHELLE, *General Electric Co.*

9:00-11:00 A.M.

TECHNIQUES AND USES OF FORECASTS OF GENERAL BUSINESS CONDITIONS

Business and Economic Statistics Section

Chairman: GROVER W. ENSLEY, *Joint Committee on the Economic Report*

Papers: (Titles to be announced):
by IRA T. ELLIS, *E. I. du Pont de Nemours and Company*
by JAMES L. RICH, *United States Steel Corporation*
by GEORGE HITCHINGS, *Ford Motor Company*
by EDMUND R. KING, *Eastman Kodak Company*
by WILLIAM W. TONGUE, *Jewel Tea Company, Inc.*

9:00-11:00 A.M.

RESPONSE ANALYSIS IN ESTABLISHMENT STATISTICS

Social Statistics Section

Chairman: RAYMOND T. BOWMAN, *Office of Statistical Standards*

Papers: "The Quality of Business Establishment Data in Commercial Surveys" by BEN LIPSTEIN, *Audit Surveys, Inc.*
"Concepts and Responses in Establishment Reporting of Employment and Payrolls" by WALT R. SIMMONS, *U. S. Department of Labor*

Discussion: LESTER R. FRANKEL, *Alfred Politz Research, Inc.*

11:00 A.M.

SECTION ON PHYSICAL AND ENGINEERING SCIENCES—BUSINESS MEETING

12:00 Noon Luncheon

BUSINESS OUTLOOK

General Session—Business and Economic Statistics Section

Chairman: ARTHUR F. BURNS, *Council of Economic Advisers*

Papers: (Title to be announced), by GEORGE W. MITCHELL, *Federal Reserve Bank of Chicago*
(Title to be announced), by DEXTER KEEZER, *McGraw-Hill Publishing Co.*

2:00-4:00 P.M.

BIOLOGICAL STANDARDIZATION

Biometric Section—Biometric Society (ENAR)

Chairman: (To be announced)

Papers: "Control of Precision in the Plate Count Assay" by IRA A. DEARMON, JR., *Camp Detrick, Maryland*
"An Approach to More Sensitive Vaccine Screening Procedures" by BYRON W. BROWN, *University of Minnesota*
"Measurements and Design in Assays of Vaccine" by JOHANNES IPSEN, *Massachusetts Dep't of Public Health*

Monday, September 10

(Title to be announced), by MINDEL C. SHEPS and PAUL MUNSON, *Harvard University Medical School*

2:00-4:00 P.M.

STATISTICS IN METEOROLOGY

Section on Physical and Engineering Sciences

Chairman: (To be announced)

Papers: "Application of Statistics to Weather Predictions" by T. F. MALONE and R. G. MILLER, *Travelers Weather Research Center*
"Statistical Forecasting Operators Based on Dynamic Equations" by DUANE S. COOLEY, *Geophysics Research Directorate, USAF*
"Some Applications of Statistics to Meteorology" by GLENN W. BRIER, *U. S. Weather Bureau*

2:00-4:00 P.M.

PRICE-COST DEVELOPMENTS

Business and Economic Statistics Section

Chairman: GEOFFREY MOORE, *National Bureau of Economic Research*

Papers: "Price Analysis Problems" by MURRAY ALTMANN, *Federal Reserve System*
"Cyclical Changes in Costs, Prices and Profit Margins" by THOR HULTGREN, *National Bureau of Economic Research*

Discussion: SIDNEY A. JAFFE, *Bureau of Labor Statistics*

2:00-4:00 P.M.

GROWTH OF MANUFACTURING IN UNDERDEVELOPED AREAS

Social Statistics Section and Business and Economic Statistics Section

Chairman: J. SILBERMAN, *International Cooperation Administration*

Papers: "New Procedures For Estimating The Mortality Rate of Establishments" by A. J. JAFFE and CAROLYN SHILLING, *Columbia Univ.*
"Selecting Industrial Development Projects in Underdeveloped Areas," by A. S. CLEVELAND, *Council for Economic & Industry Research*

Discussion: ALVIN MAYNE, *Puerto Rico Planning Board*
C. D. STEWART, *U. S. Department of Labor*

2:00-4:00 P.M.

CONTRIBUTED PAPERS—II

General Session

Chairman: (To be announced)

Speakers: (To be announced)

Note 1:

The following sessions are being co-sponsored by the American Statistical Association with the American Sociological Society. These sessions are part of the program of the American Sociological Society, but are listed here as being of more than usual interest to members of ASA. Complete details regarding these sessions will be in the final program of the American Sociological Society.

Friday, September 7

1:30-3:30 P.M.

RESEARCH REPORTS ON METHODS OF RESEARCH

Chairman: LEO A. GOODMAN, *University of Chicago*

3:30-5:30 P.M.

CURRENT STUDIES OF FERTILITY AND INFANT MORTALITY

Chairman: FREDERICK F. STEPHAN, *Princeton University*

Saturday, September 8

9:00-11:00 A.M.

CRITICAL PROBLEMS IN NEW QUANTITATIVE TECHNIQUES

Chairman: LEO A. GOODMAN, *University of Chicago*

1:30-3:30 P.M.

MIGRATION AND INDUSTRIAL DEVELOPMENT

Chairman: FREDERICK F. STEPHAN, *Princeton University*

Sunday, September 9

9:00-11:00 A.M.

THEORY OF ECOLOGICAL ORGANIZATION

Chairman: DONALD J. BOGUE, *University of Chicago*

3:30-5:30 P.M.

RESEARCH IN HUMAN ECOLOGY

Chairman: DONALD J. BOGUE, *University of Chicago*

Note 2:

Plans are being made for the demonstration of electronic digital computers in the Detroit area.

Outstanding McGRAW-HILL Books

STATISTICAL THEORY IN RESEARCH

By R. L. ANDERSON, University of North Carolina, and T. A. BANCROFT, Iowa State College. 399 pages, \$7.00

Divided into two parts, this text first presents basic statistical theory, including the elementary principles of probability, population and sampling distribution theory with moment-generating functions, orthogonal linear forms, and the theory of estimation and tests of significance. A chapter on the theory behind the uses of Chi-square is included. Part II presents the theory of least squares and its use in the analysis of actual experimental data, including multiple regression, experimental design, and variance component models.

INTRODUCTION TO THE THEORY OF STATISTICS

By ALEXANDER McFARLANE MOOD, General Analysis Corporation. 431 pages, \$6.50

A modern text providing a basic introduction to courses in the theory of statistics and to the more advanced courses in applied statistics. The book first develops the necessary concepts and models of the theory of probability, distribution, and sampling, and then proceeds to explore the two major problems of scientific inference—the estimation of quantities and the testing of hypotheses. The development of the theory is always motivated by practical considerations, and applications of the theory are amply illustrated.

ELEMENTARY STATISTICS For Students of Social Science and Business

By R. CLAY SPROWLS, University of California, Los Angeles. 422 pages, \$5.50

A basic, elementary text for all social science and liberal arts students. It deals primarily with the formulation of decisions based upon incomplete information. It considers statistics important as inference, not description. Emphasis is on principles of inference, the ideas of hypotheses, risks of error, and the evaluation of these risks in terms of the operating characteristics of a statistical test. Also included is the treatment of a time series as a stochastic or random variable and the employment of some statistical tests for the detection of systematic components before estimating them.

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This new book develops some basic mathematical-logical concepts of statistics. It provides an understanding of the language used in mathematical statistics, including that of elementary calculus. The logic of statistical inference is presented using finite populations, making it possible for the beginning student to work through the basic concepts without skipping any of the mathematics involved. Also included are the most frequently used mathematical models, both discrete and continuous with numerous applications.

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QUESTIONS AND ANSWERS

Edited by ERNEST RUBIN

U. S. Department of Commerce
and American University

Adjusting Baseball Standings for Strength of Teams Played

Discussion by John H. Smith

In April, Datatron, an electronic giant brain was fed various data according to a diet prescribed by Professor Norbert Wiener. Datatron picked the Brooklyn and Detroit teams as pennant winners, respectively, in the National and American Leagues. At the same time a pre-season poll of 30 sports writers picked as pennant winners Brooklyn and New York. In both cases, the principle of selection was based on historical data of the teams and of the players.

Let us now consider the problem of predicting the pennant winners after a few weeks of competition have been completed in the current season. The question that arises here is: how are the current results to be adjusted so as to take into account the fact that each team has not played an equal number of games with each of the adversaries.¹ Professor John H. Smith of American University presents in the discussion which follows, a suggested solution of this problem.² I would appreciate comments on the method presented and suggestions as to applications thereof in fields other than sports.

Early in the baseball season, the published standing of a given major league team may be lower (or higher) than it "should" be because it has played too large a proportion of its games with strong (or weak) teams. It should be emphasized that there are other factors which may be (and often are) more important than variation in strength of opponents. However, it is possible to adjust the published percentages (proportion of games won) to allow for this single factor.

In the process of developing a satisfactory method of adjusting percentages for strength of opposition, several alternatives were formulated and compared. The easiest of these is to find the adjusted percentage for each team by averaging the proportions of games it has won from its seven opponents. Unfortunately, this method cannot be used until each team has played at least one game with every one of the other seven teams. Even then some of the proportions may be very unreliable. For example, in the case of two teams who have met only once, the method of averaging percentages seems to imply that the winner of the single game will be able to win every one of the remaining 21 games to be played by these two teams! Accordingly, even

though the foregoing method is simple and does allow for each team being relatively effective against certain other teams, it is not recommended except possibly for deriving first approximations to use in an iterative method.

The improved method actually proposed herein can perhaps best be explained in terms of 56 probabilities — one for each team winning over each opponent. Let p_{ij} be an estimate of the probability of team i winning over team j . These estimates are made in such a way that they yield games already won by each team when they are applied to games already played and so that the difference $p_{ik} - p_{jk}$ is the same for every k . Thus, the possible tendency for otherwise equally strong teams to differ in their ability to win over a given third team is not allowed for.

The first step in the process of adjusting a set of percentages for relative strength of opposition is to construct a set of measures of relative strength by means of the formula

$$h_i' = 1.75p_i' - 0.375,$$

where p_i' is the percentage of games won by team i obtained from the current standings. The next step is to calculate second approximations h_i'' according to the formula

$$h_i'' = (W_i - L_i + \sum n_{ij}h_j')/T_i$$

where W , L , and T denote games won, games lost, and total games played, respectively. Successive approximations are calculated in the same way until no further adjustments are necessary. The final estimates of the p_{ij} 's are computed by means of the formula

$$p_{ij} = 0.5(1 + h_i - h_j)$$

and the percentages for standings adjusted for relative strength of opposition are found by either of the forms

$$p_i = \sum p_{ij}/7 = (8h_i + 3)/14,$$

the latter form depending on having the eight h_i 's adjusted (by an additive constant) so as to average exactly one-half.

The foregoing method was applied to published American League standings just before the games played on April 29 and May 6, 1956. The results are

¹ Each of the 8 teams plays 154 games in a season, playing 22 games against each team in the league.

² A related, though more complicated problem, was suggested to us by Mr. Robert E. Simpson of Washington, D. C. He believes batting averages should take into account the strengths of the pitchers.

presented in table 1. For April 29, percentages of all first division teams were adjusted downward because their opponents had been weaker than expected. The largest adjustment was 61 points upward for Kansas City. At this date the Athletics had played twice as many games with the three strongest opponents as with the three weakest ones.

For May 6, the percentages for the three leaders were again adjusted downward while all of the others were adjusted upward. In this case, Cleveland had the largest adjustment, a loss of 57 points. This adjustment indicates that Chicago should be above Cleveland instead of being tied. At the same time Kansas City and Baltimore should have been tied instead of having percentages differing by 4 points.

TABLE 1
Published and Adjusted American League Standings with Measures of Relative Strength

Term	April 29, 1956			May 6, 1956		
	Percentage		h	Percentage		h
	Pub.	Adj.		Pub.	Adj.	
New York.....	.727	.707	.862	.688	.675	.807
Cleveland.....	.556	.513	.523	.600	.543	.576
Chicago.....	.833	.815	1.051	.600	.575	.631
Washington.....	.545	.500	.500	.529	.535	.561
Boston.....	.444	.475	.456	.500	.503	.505
Detroit.....	.375	.325	.194	.400	.405	.334
Kansas City.....	.333	.394	.315	.357	.382	.293
Baltimore.....	.273	.271	.099	.353	.382	.293

CONTRIBUTED PAPERS INVITED

Members of the Association and their guests are invited to submit papers for the Contributed Papers Sessions to be held at the 1956 Annual Meeting in Detroit.

One session will be devoted to papers of interest to the **Business and Economic and the Social Statistics Sections**. A second session will include papers of interest to the **Biometrics and the Physical and Engineering Sections**. **Papers on Training** can be submitted to either session.

The papers may be concerned with pure statistical methodology or the findings of statistical studies. They should be limited to 10 minutes of speaking time, or about five double-spaced typed sheets. Each should be accompanied by an abstract of not less than 100 words. If it is desired that the title only be read, then the paper should be so designated and only the abstract need be submitted. Final deadline for submission of papers is July 15, 1956.

Papers on **Business, Economic or Social Statistics** should be sent to Roy Reiersen, 80 Cranberry Street, Brooklyn 1, New York. Papers on **Biometrics and Physical and Engineering** topics should be sent to Milton Terry, Bell Telephone Laboratories, Murray Hill, New Jersey.

Papers from statistical students and younger members of the Association are particularly invited. Members who are teachers or supervise junior personnel are urged to call this notice to the attention of their students or assistants. Copies of this notice for posting on bulletin boards can be obtained from the Secretary of the Association.

CORRECTION

In the February 1956 issue of *The American Statistician* a typographical error appeared in the article by Beckman and Quarles entitled "Multiple Regression and Correlation Analysis on the IBM Type 701 and Type 704 Electronic Data Processing Machines." As a result of the error, much of the meaning of the second paragraph on page 8 was affected. Below is reproduced the correct version.

"Therefore, it appears to us unnecessary to follow the detailed procedure of the von Neumann-Goldstine matrix inversion method, a substantial part of which is designed, not only to minimize the number of arithmetic operations and consequently the growth of round-off error, but also to avoid floating-point operations. The inversion subroutine that we are planning to use in the 704 program will employ double-precision floating-point arithmetic operations, maintaining the equivalent of approximately 16 decimal digits in the fractional parts of the floating-point numbers. It will be an elimination scheme including positioning for size."

NEWS—Continued from page 4

Appraisal of the Census Income Data for Farm Families—D. Gale Johnson, University of Chicago
Some Income Adjustment Results from the 1949 Audit Control Program—Marius Farioletti, Internal Revenue Service

Reasons for Differences in Survey Estimates of Income: Survey of Consumer Finances and Census Quality Check—Monroe G. Sirken, National Office of Vital Statistics; E. Scott Maynes, Survey Research Center, University of Michigan; and John A. Frechtling, Economic Studies Department, Ford Motor Company

Coordination of Post-Enumeration Survey and Old-Age Survivors Insurance Earnings—Benjamin J. Mandel and Irwin Wolkstein, Bureau of Old-Age and Survivors Insurance, Social Security Administration

Comparison of Income Reported in the 1950 Census and on Income Tax Returns—Herman P. Miller and Leon R. Paley, Bureau of the Census

Post-Enumeration Survey: Study of Income Distributions of the 1950 Census of Population—Leon Pritzker, Case Institute of Technology, and Alfred Sands, Bureau of the Census

Changes in the Industrial Distribution of Wages in the United States, 1939-1949—Herman P. Miller, Bureau of the Census

Plans are to publish the papers and discussions in the National Bureau's series, "Studies in Income and Wealth".

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FEDERAL STATISTICAL ACTIVITIES—Continued from page 6

"Government Statistics for Business Use"

A revised edition of *Government Statistics for Business Use*, edited by Philip M. Hauser of the Department of Sociology, University of Chicago, and William R. Leonard, Director of the United Nations Statistical Office, has recently been issued. The new edition brings up to date the volume published in 1946, prepared by the same editors, describing the content and availability of Federal statistics in specific areas, with special emphasis on their potential uses for business and economic purposes. The introductory chapter, written by the editors, deals with the increasing need for statistics, the organization of Federal statistical services, recent statistical developments, and summary volumes of Government statistics. The Foreword is again written by Stuart A. Rice. Topics covered in separate chapters are:

National Income and Other Business Indicators—Milton Gilbert

Manufacturing—Maxwell R. Conklin

Mineral Statistics—Y. S. Leong

Agriculture—Conrad Taeuber and J. Richard Grant

Retail, Service, and Wholesale Trades—Howard Grieves,

Harvey Kailin, and Rexford C. Parmelee

Foreign Trade Statistics—J. Edward Ely

Transportation and Other Public Utilities—Frank L. Barton

Money, Credit, and Finance—Edward T. Crowder

Prices—Lester S. Kellogg

Housing and Construction—Paul F. Krueger

Population—Philip M. Hauser

Labor—Charles D. Stewart

International Statistics—P. J. Loftus

Some Uses of Sampling and Sampling Aids—Joseph Steinberg and Morris H. Hansen

All chapters have been revised since the 1946 edition, and the chapters on international statistics and sampling have been added. The 440-page volume is published by John Wiley & Sons, New York, and the price is \$8.50.

Expenditures for Supplementary Employee Remuneration

The Bureau of Labor Statistics has issued, as Bulletin No. 1186, "Problems in Measurement of Expenditures on Selected Items of Supplementary Employee Remuneration—Manufacturing Establishments, 1953." The report presents the results of the exploratory survey of employers' record-keeping practices and their ability to provide actual or estimated annual expenditures for paid vacations, paid holidays, paid sick leave, premium pay for overtime, shift premium pay, premium pay for work on holidays, pension plans, legally required payments, and insurance, health and welfare plans. It analyzes the factors affecting differences among companies in expenditure levels for each item, expressed in cents per hour, percent of payroll, and dollars per year per employee. Primary emphasis is placed on problems in the development of survey techniques.

Data on the magnitude of expenditures on supplementary employee remuneration are needed to round out the statistical information regularly published by BLS on average earnings, wage rates and related wage practices. Before any comprehensive study of such expenditures could be made, however, more information was needed on the availability of records, the willingness and ability of industry to provide data, and other matters of methodology and definition. The exploratory study of the problems involved for manufacturing establishments, reported in Bulletin 1186, was undertaken with financial assistance from the National Bureau of Economic Research, to help determine the scope of feasible expenditure studies and useful techniques for such studies.

Bulletin 1186 may be purchased, at 50 cents a copy, from the Superintendent of Documents, Government Printing Office, Washington 25, D. C.

—NELSON M. BORTZ, Acting Chief
Division of Wages and Industrial Relations,
Bureau of Labor Statistics
Department of Labor

NEWS ABOUT MEMBERS

Philip Ash is Assistant Manager of Industrial Relations, the Inland Steel Company, Chicago. He is responsible for management development, training and education.

Samuel I. Askovitz has been appointed Chief of the Tumor Registry at the Hospital of the University of Pennsylvania, as biostatistician in the field of cancer. He is continuing as consultant in mathematics and staff physician at the Albert Einstein Medical Center and at the Wills Eye Hospital, Philadelphia, and in the private practice of ophthalmology.

Dave Barr is now working in the Applied Mathematics Division of Statistical Services at Eglin Air Force Base. He does some programming for the IBM 650 computer and occasionally deals with problems in probability and statistics.

John Bidwell's new position is Assistant General Manager, Dewey & Almy Chemical Co. of Canada, Ltd., Montreal.

Samuel H. Brooks is now a consultant in Operations Research at the Stanford Research Institute. His present project is the problem of boxcar distribution for the Southern Pacific Railroad.

Norman Bush is now employed by RCA Service Company at Patrick Air Force Base, Florida. He is working as a statistician in the Analysis Section of Data Reduction.

Jack D. Colelough, formerly a senior economist in the Federal Reserve Bank of Dallas, is now with the Market Research Department of the Standard Oil Company (Ohio) in Cleveland.

George A. Cooper has been named president of Tabulating and Business Services, Inc. in New York City.

John Leroy Folks is doing graduate work at Iowa State College toward a Ph.D. in statistics. He received the 1955-56 Iowa State Alumni Achievement Fund Fellowship.

Kirk Fox has joined the Operations Analysis Office, U. S. Atomic Energy Commission, Washington, D. C., as Production Economist.

Lowell T. Galt, formerly Assistant Director for Operations of the Census Bureau, will serve as Principal Statistical Adviser to the Government of Pakistan.

Leon S. Geoffrey, Staff Assistant to the Director, Commerce Field Service, is on a six-month assignment to the Office of Defense Mobilization, Plans and Readiness Area.

Selma F. Goldsmith, Chief, Income Section, Office of Business Economics,

Department of Commerce, has been given a Rockefeller Public Service Award to study methodology used in developing estimates of income size distribution in Great Britain and Canada.

William J. Hickey, Analytical Statistician formerly with the Air Force Procurement District Office at St. Louis, Missouri, has transferred to the Statistical Branch, Quality Control Division, Bureau of Ordnance, Navy Department, in Washington, D. C.

Vida Grace Hildyard is now a mathematical statistician with the Systems Analysis Department of Remington Rand Univac.

Peter R. Hofstaetter (formerly Department of Psychology, The Catholic University of America, Washington, D. C.) has been appointed ordinary Professor of Psychology and Head of the Department at the Hochschule fuer Sozialwissenschaften, Wilhelmshaven-Ruestersiel, Germany.

Marvin A. Kastenbaum was awarded a Ph.D. degree in Experimental Statistics at North Carolina State College in January, 1956. He is now employed as a statistician on the Mathematics Panel at the Oak Ridge National Laboratory.

Hans Kellerer, Freie Universitat Berlin, a Fellow of the American Statistical Association, takes charge, beginning with the 1956 summer term, of the "Lehrstuhl für Statistik und ihre Anwendungen in den Wirtschafts- und Sozialwissenschaften" an der Staats wirtschaftlichen Fakultät der Universität München, and will also direct the Seminar of Statistics at the same University, Munich, Bavaria, as the successor of Professor Dr. O. Anderson.

Wharton F. Keppler has recently transferred from his position as Operations Analyst, Air Proving Ground Command, Eglin Air Force Base, Florida, and is now Chief, Statistics Section, Engineering Sciences Division, Signal Communications Department, Army Electronic Proving Ground, Fort Huachuca, Arizona.

George E. Kuhn has a new job as Quality Control Supervisor at the Bernheim plant of Schenley Distillers, Inc., at Louisville, Kentucky. He previously worked at Schenley's Cincinnati office in quality control and statistical research work.

Jay P. Leary, Jr. has joined the Franklin Institute as Senior Staff Engineer in charge of experimental design.

Alfred Lieberman, formerly with the Advance Development Division of the AVCO Mfg. Corp., is now a mathematical statistician with the Bureau of Ships, Department of the Navy, Washington, D. C.

Lewis A. Maverick, Professor of Economics at Southern Illinois University, retired from active teaching on February 4, 1956. He and Mrs. Maverick will live in Santa Monica, California.

Walter Mitchell, Jr., Consultant in Business Economics, is now associated with Welling & Woodard, Industrial Consultants. He has also accepted appointment as Associate Director (for Marketing and Applied Economics) of the Management Development Program of Case Institute of Technology.

Charles N. Moore is on leave from the Business Statistics Department of the University of Alabama doing research with the Air Material Command, USAF, in the field of electronic data processing systems. He has received a research award from the Air University.

John W. Morse of the International Cooperation Administration, who has been Chile Mission Statistician and consultant to the government of Chile, is returning and will be placed on leave for a year for purposes of study and research at Cornell.

Joseph M. Moser is a Graduate Fellow at St. Louis University, where he has started work on a Ph.D. degree.

Oscar N. Olstad, who has completed work for the M.A. degree at the University of Minnesota, has joined the Mercury Division, Ford Motor Company, Detroit, as a sales and market analyst, Sales Analysis Department.

Paul R. Rider of the Wright Air Development Center, Wright-Patterson Air Force Base, Ohio will spend the summer on temporary duty with the Summer Research Group of the Holloman Air Development Center. The group will be located at Clouderoft, N. M.

Daniel E. W. Schumann is teaching in the Department of Statistics at the University of Stellenbosch, Stellenbosch, South Africa.

Walton Seymour, who has been in private practice as a consultant in Washington, is now consultant in power economics for the Executive Director of the Puerto Rico Water Resources Authority, and has moved his home and office to San Juan.

Julius Shiskin, Chief Economic Statistician, Office of Statistical Standards, Bureau of the Census, has been granted

a Rockefeller Public Service Award to explore the possibility of using an electronic computer to analyze current business conditions.

Robert M. Sigmond is Executive Director, Hospital Council of Western Pennsylvania, in Pittsburgh.

George W. Snedecor is completing a five-month assignment in Campinas, State of Sao Paulo, Brazil, supported in part by the Rockefeller Foundation. He has been consulting with research workers on the design and analysis of agri-

cultural experiments, mainly at the Institute of Agronomy in Campinas, and conferring on the organization of a Center for teaching and research in experimental statistics.

Ira G. Spicer, formerly a statistician for the State of Minnesota, is now employed as Development Mathematician at the Minneapolis-Honeywell Regulator Company.

John Stansbrey has joined the Fundamental Research Department of the National Cash Register Company, in Dayton, Ohio.

W. F. Sutherland has retired from his position as Director of Industrial Relations, Toronto Hydro-Electric System, and is engaging in private practice as an industrial relations consultant.

John S. White, formerly Assistant Professor of Statistics at the University of Manitoba, has accepted a position in the Operations Analysis Department of Ball Brothers Co., Muncie, Indiana.

Otto E. Zwanzig has become General Sales Manager of the British Columbia Electric Co., Ltd., in Vancouver.

CHAPTER NOTES

ALBANY

At the regular meeting of March 14th Abbott S. Weinstein, Senior Statistician, New York State Department of Commerce, and President of the Albany Chapter, spoke on "Some Recent Developments in Time Series Analysis". An informal dinner preceded the meeting.

BOSTON

The speaker at the April meeting was Dr. Frederick Mosteller of Harvard University. Dr. Mosteller discussed "Multiple Comparisons," reviewing work by Tukey, Scheffe and Duncan on establishing protection levels for multiple comparisons among sample means.

At the May meeting Dr. Milton Terry of Bell Telephone Laboratories spoke on "The Analysis of Planned Experiments," considering the several aspects and aims of experimentation together with the appropriate forms of analysis.

BUFFALO-NIAGARA

The December meeting was devoted to a discussion of the Monte Carlo Method. Participating were Dr. Joseph G. Hoffman of Roswell Park Memorial Institute, Robert Mirsky of Cornell Aeronautical Laboratory and Dr. Abe Lillienfeld of Roswell Park, moderator. Mr. Mirsky introduced the subject by discussing the mechanics of the method and pointed out that since Monte Carlo is in effect a sampling technique, it also has some limitations as to accuracy. He carried out an integration with the aid of a table of random numbers and showed how in some situations inference from the Monte Carlo approximation can lead to an understanding of how to obtain an exact solution. He also illustrated the application of Monte Carlo in the solution of a random walk problem, partially studied analytically.

Dr. Hoffman's paper, "Tumor Cell

Growth and Cell Population Dynamics: Monte Carlo Methods", was based on a study which he conducted jointly with Nicholas Metropolis and Vera Gardiner of Los Alamos Scientific Laboratory. One of the major obstacles to the estimation of the growth of a cell population, such as occurs in ascites cells in transplantable mouse tumors and in pinch grafts of skin, has been the randomness in the intermitotic time. With the aid of the Los Alamos digital computer, the Maniac, Monte Carlo was used to explore the effect of three major distributions of intermitotic times, to which the chain reaction arising from binary fission of cells is very sensitive. Several interesting results were obtained. Dr. Hoffman pointed out, however, that in the Dba mouse tumor grown subcutaneously, there appear to be eighteen random events in sequence that determine cell division. The meanings of some of these events are yet to be clarified. He expressed hope that the Monte Carlo method affords a means for estimating them from data on various aspects of individual cell life.

CENTRAL INDIANA

The Chapter's March meeting was held at Butler University. Dr. Om P. Aggarwal of the Statistical Laboratory of Purdue University spoke on "Random Sample Surveys for the Estimation of Crop Yields in India". Dr. Aggarwal described the methods of randomization which were developed to utilize most fully the previously existing Agriculture Department organization and to minimize the extra cost of the experiments. Various sources of possible bias were discussed, along with the tests made to measure these biases and the steps taken to remove them.

At the April meeting, also held at Butler University, the speaker was Dr. Edgar P. King, president of the chapter and Staff Research Statistician with Eli Lilly and Company. His topic was, "Some Non-technical Problems in Sta-

tistics". The discussion centered around the question of the relationship of the statistician, as such, to the subject area in which he is working or consulting. The problem of communication between statisticians and scientists in other fields was discussed. Dr. King also pointed out that the almost intuitive methods developed by non-statisticians to extract information from data can sometimes offer the statistician clues to the solution of the problem of discovering the kinds of statistical methods which are useful and applicable.

CHICAGO

A dinner meeting was held on March 22nd, at which Philip M. Hauser, Professor of Sociology and Director of the Population Research and Training Center of the University of Chicago, spoke on "Statistics, Flora and Fauna in Southeast Asia". Dr. Hauser, who had just come back from a trip to the Far East, illustrated his talk with pictures.

On April 26th there was a joint dinner meeting with the Chicago Chapter of the American Marketing Association. Walter F. Hoadley, Treasurer of the Armstrong Cork Co., discussed the construction outlook for 1956.

The speaker at the dinner meeting of May 3rd was Ewan Clague, Commissioner of the U. S. Bureau of Labor Statistics. Mr. Clague's subject was "Measuring Trends in Productivity".

Luncheon meetings were held on March 15th, April 5th and 19th, and May 3rd, the last three being joint meetings with the Chicago Chapter of the American Marketing Association. At the March meeting Professor Wayne McMillen of the School of Social Service Administration, University of Chicago, spoke on "Central City-Suburban Relationships in Financing and Welfare Activities". The speaker at the April 5th luncheon was Dr. Marcello L. Vidale, Staff Member, Arthur D. Little, Inc., whose topic was "Problem Solving; the Game of Successful Business". At the

April 19th meeting, Howard G. Diesslin, Assistant Managing Director, Farm Foundation, discussed the subject "The Farm Problem—Is It Real?" The May 3rd luncheon meeting heard Clyde M. Hart, Director of the National Opinion Research Center, speak on "Interviewing in Social Research".

The Annual Midwest Conference was sponsored for the third year by the Chicago Chapter and the Business Research and Statistics Committee of the Chicago Association of Commerce and Industry. The Business and Economics Section of the ASA, the American Marketing Association, the American Society for Quality Control, and the American Economic Association also cooperated. The theme of this year's conference, which was held at the Congress Hotel on April 13th and 14th, was "Today's Research Tools for Better Decision Making". The program included sessions on new techniques in sampling, the flow-of-funds system as a tool for economic analysis, population estimates for small areas, the 1954 Census of Business, applications of statistical decision theory, economic sector and other specialized price indices for business analysis, and programming of electronic computers. The business outlook for the second half of 1956 and automation were discussed at the luncheon meetings.

HAWAII

A luncheon meeting was held on March 19th at which Dr. Calvert L. Dedrick, Coordinator of International Statistics of the Bureau of the Census, described the work of the Census Bureau with special emphasis on plans for the 1960 Censuses of Population and Housing. After the talk there was an informal discussion of suggestions for improvements in these censuses.

The Hawaii Chapter has appointed a Statistics Committee which will hold luncheon meetings midway between regular chapter meetings. Its responsibilities will be (1) to develop new statistical sources and enlarge and develop existing sources where useful to the community, (2) to develop and use standards for statisticians and statistical publications, and (3) to make long range plans for the achievement of these objectives. Members of the committee are: Fred M. Coland, Chairman, Gordon Frazier, Richard Takasaki, Charles Congdon and Robert C. Schmitt. The Committee will work through subcommittees and will report its activities at each regular meeting of the Hawaii Chapter.

LOS ANGELES

At the dinner meeting of March 29th James R. Taylor, Research Coordinator of the Air Pollution Control District of Los Angeles County, spoke on "The

Application of Statistics by the Air Pollution Control District". Mr. Taylor heads the Project Control Section which directs the planning for air monitoring, and evaluates test data.

"Can Statisticians Be Trained to Use the Electronic Brains or Vice Versa?" was the subject of the talk at the April 26th dinner meeting. The speaker was Dr. Thomas Southard, Social Research Mathematician and Chairman of the Computing Committee, Institute of Numerical Analysis, University of California at Los Angeles.

A request to change the name of the chapter from "Los Angeles" to "Southern California" was approved by the Board of Directors at its April 27th meeting.

MONTREAL

The speaker at the meeting held on March 14th was Dr. George A. Ferguson, Professor of Psychology at McGill University. The subject of Dr. Ferguson's talk was "Statistical Methods in Psychology", and he introduced his topic by defining psychology and the way in which statistical methods are applied in this field. He outlined the two broad areas in which most of the statistical work is carried on—psycho-physics and psychological test theory—and gave numerous examples and details of applications. For those members interested in the teaching of statistics, the speaker reviewed the current status of statistical methods in the curriculum for psychology students.

On April 18th, Dr. Allan E. Paull, Chief Statistician of Abitibi Power & Paper Co. Ltd., addressed the Chapter on "Industrial Applications of Linear Programming". Dr. Paull outlined several types of applications in the industrial field, and elaborated on two applications which have been employed by his company. One of these illustrated how transportation scheduling deals with the problem confronting a multi-mill company, determining how the various orders should be assigned to the mills so as to reduce the total company freight bill to a minimum. The other application deals with the problem of reducing the trim waste on the paper machine, determining on which machines and in what combinations the orders should be made so as to result in a minimum overall trim loss. Using simplified examples, the speaker traced the various steps involved in the formulation and solution of a linear programming problem.

PHILADELPHIA

A dinner meeting was held on March 23rd at which Dr. C. R. Whittlesey, Professor of Finance and Economics at the University of Pennsylvania, spoke on the subject "Fact, Fancy, and the Federal Reserve".

On April 20th a joint meeting was held with the Philadelphia Section of the American Society for Quality Control. The speaker was E. C. Harrington, Jr., Manager, Industrial Statistics, Monsanto Chemical Co.—Plastics Division.

ROCHESTER

On January 10th, Stephen P. Taylor, Economist with the Federal Reserve Board, spoke about "The New Flow of Funds System of National Accounts". This new system of national economic accounting, many analysts believe, will be of great value in promoting a clearer understanding of the workings of the American economy. The objective of the new accounts system is to provide a comprehensive and systematic record of all transactions in the economy that are affected by a transfer of credit or money, or by a combination of the two.

The 12th Annual Quality Control Clinic was held February 21, 1956 with over 800 persons in attendance. One of the sessions at this Clinic was co-sponsored by the Rochester Chapter of the ASA. Speakers at this session were Cuthbert Daniel, Consultant, and Dr. R. M. DeBaum and L. R. Olson of the American Cyanamid Company who discussed various aspects of experimental design with particular emphasis on factorial experiments and the recent response surface techniques of G. E. P. Box. Discussions on the program were Prof. S. L. Crump of the University of Rochester and Prof. R. E. Bechhofer of Cornell University.

At a joint meeting with the University of Rochester Management Clinic on March 15, 1956 the speaker was Ewan Clague, Commissioner of Labor Statistics for the U. S. Dept. of Labor. Dr. Clague emphasized the role of statistics in promoting harmonious Labor-Management relations as well as providing a guide for the solution of other economic problems.

SACRAMENTO

On December 21st a panel meeting was held on the subject "What Types of People Do We Need to Meet the Increasing Demands on the Statistical Units for Material?", with particular reference to recruitment for the State of California. The Chairman was Sam Wood, Assembly Interim Committee on Water Problems, and the speakers included Philip Keller, Department of Social Welfare; Richard Morgan, Department of Mental Hygiene; Robert Gustafson, Board of Equalization, Sacramento State College; Edmund Radsliff, Department of Mental Hygiene, Sacramento State College; and Kenneth A. Wenner, Personnel Board.

A panel meeting preceded by dinner

was held January 18th on the economic outlook for 1956. Andrew Trice of Sacramento State College was moderator, and other members of the panel were Ralph Curry, State Department of Finance; Joe Good, Sacramento Chamber of Commerce; George Roche, State Department of Employment; and George Scott, State Department of Agriculture.

Maurice K. Strantz of the U. S. Bureau of Reclamation was the speaker at the February 15th dinner meeting. His topic was "Effect of a Resource Development Program—An Example in Irrigation", dealing particularly with the economic impact of irrigation.

At the dinner meeting of March 21st Robert Brenner, Associate Statistical Engineer, Institute of Transportation and Traffic Engineering, University of California at Los Angeles, discussed "Statistical Methodology for Street and Highway Engineering". Mr. Brenner described the application of statistical measures to determine highway capacities and to analyze traffic flows. The meeting was arranged by Sam Osofsky, who was recently appointed liaison officer for the ASA Section on Physical and Engineering Sciences.

"Statistics in Quality Control" was the subject of the April 18th dinner meeting. The speaker was Harry Lambros, who is a mathematician in the Statistical Quality Control Department of Aerojet General Corporation.

SAN FRANCISCO

The following persons have been elected officers for the year 1956:

President, MRS. HELEN NELSON, Division of Labor Statistics and Research, Calif. Dept. of Industrial Relations.

Vice President, HAROLD L. BUMA, Research Department, Federal Reserve Bank of San Francisco.

Secretary-Treasurer, K. PHILLIS BEATTIE, Bureau of Labor Statistics, U. S. Dept. of Labor.

ST. LOUIS

The subject of the luncheon meeting held on March 21st was "The 1956 Popu-

lation Estimate by the Metropolitan Census Committee". The methods used in this estimate, together with their limitations, were discussed by James Appel of Roy Wenzlick & Co. and William Kester of the Federal Reserve Bank.

At the April 18th meeting the speaker was H. Crockett, whose subject was "Negro Students' Choices of High Schools in Integration".

WASHINGTON

The topic for the March 19th meeting was "Statistics and the Agricultural Crisis". Joseph S. Davis, Member of the Council of Economic Advisers, was chairman, and O. V. Wells, Administrator of the Agricultural Marketing Service, and O. C. Stine, Senior Specialist, Library of Congress, were the speakers.

The April 23rd meeting was dedicated to the memory of Samuel Weiss. The theme of the meeting was "The Improvement of Data", a subject in which Sam was vitally interested. Professor William G. Cochran of Johns Hopkins University chaired the meeting, which consisted of brief talks in a number of fields. The participants and their subjects were: Helen F. Demond, Internal Revenue Service—"Tax Returns as a Source of Benchmark Statistics"; Dorothy M. Gilford, Office of Naval Research, and Charles L. Marks, Federal Trade Commission—"Use of a Sample Survey for Estimating an Aggregate Quarterly Financial Statement for a Population of Corporations"; Walter A. Hendricks, Agricultural Marketing Service—"Non-sampling Errors in Agricultural Surveys"; Julius Shiskin, Census Bureau—"New Measures of Economic Fluctuations, Preliminary Comments and Illustrations"; Monroe G. Sirken, Iwao M. Moriyama and William Haenszel, Public Health Service—"A Proposed Study for Extending the Scope and Improving the Quality of Vital Statistics"; R. T. Smith, Interstate Commerce Commission—"Controlling the Quality of Railroad Traffic Statistics"; Theodore D. Woolsey, Public Health Service, and Harold Nisselson, Census Bureau—"Some Problems in the

Statistical Measurement of Chronic Disease"; and Dudley E. Young, Bureau of Labor Statistics—"Some Notes on a Study of Response".

The Washington Statistical Society has sponsored, jointly with the Association for Computing Machinery, The Institute of Management Sciences, the Operations Research Society of America, the Society for Industrial Applied Mathematics, and the Society for Advancement of Management, a series of eight lectures on computers and automation. The sessions have been well attended, with 300-400 persons present. The introductory session was held on March 21st, with Robert D. Huntoon, Associate Director of the National Bureau of Standards, as speaker, and Harlan Meal, ORO, Johns Hopkins, as discussant. The subject of the second meeting on March 28th was "Organization and Administration of a Computer Installation", H. R. J. Grosch, Aircraft Turbine Department, General Electric Corporation, being the speaker and John Todd, National Bureau of Standards, the discussant. At the April 4th session, "Application of a Computer to a Particular Task," Joseph F. Daly, Bureau of the Census, and Alan Hoffman, National Bureau of Standards, were the speakers. R. W. Hamming of the Bell Telephone Laboratories and Ida Rhodes of the National Bureau of Standards discussed "Machine Programming and Coding" on April 11th. On April 18th Sam Alexander, National Bureau of Standards, and Lancelot W. Armstrong, Department of the Army, talked on "Computing Equipment". Three films were shown by Jay W. Forrester, of Lincoln Laboratories, MIT, at the April 25th session on "Scientific Applications and the Automation of Physical Processes": "Making Electrons Count", "Digital Control of a Milling Machine", and "Sage" (Air Defense System). Max Woodbury, Office of Naval Research, and Alan Newell, Carnegie Institute of Technology, discussed "Information and Decision Processes" on May 2nd. The final lecture, "Long Time Consequences", was given on May 9th by Louis N. Ridenour, Missile Systems Division, Lockheed Aircraft Corporation.

New Pittsburgh Chapter

The Board of Directors issued a charter to the Pittsburgh Chapter at its April 27th meeting. Temporary officers of the new chapter are:

President, DONOVAN S. THOMPSON

Vice President, WILLARD H. CLATWORTHY

Secretary, HERBERT GINSBURG

Treasurer, ROBERT HOOKE

ASA members in the Pittsburgh area should contact Mr. Ginsburg, Materials Engineering Dept., Dept. K 90, Westinghouse Elec. Corp., East Pittsburgh, Pa., for information about meetings and other activities of the chapter.

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Statistical Problems of the Kinsey Report

by COCHRAN, MOSTELLER and TUKEY. The report of the ASA Committee to advise the National Research Council Committee for Research in the Problems of Sex. 331 pages, in blue buckram. Contents include: Statistical Problems of the Kinsey Report; Appendix A: Discussion of Comments by Selected Technical Reviewers; Appendix B: Comparison With Other Studies; Appendix C: Proposed Further Work; Appendix D: Probability Sampling Considerations; Appendix E: The Interview and The Office as We Saw Them; Appendix F: Desirable Accuracy; Appendix G: Principles of Sampling. *Price:* \$3.00 to members of ASA; \$5.00 to others.

Proceedings of the Business and Economic Statistics Section

The Papers Presented by the Business and Economic Statistics Section of the ASA at the 114th Annual Meeting, held in Montreal, Canada, September 10-13, 1954. Sessions were held on: Measuring the Effects of Social Payments on the Economy; The Business Outlook; The Canadian Balance of International Payments; Consumer Survey Data as a Method of Forecasting Economic Fluctuations; Economic Forecasting Techniques I; The Reliability and Meaning of Employment and Unemployment Statistics; Measuring the Effect of Pension Funds on the Economy; Stock Market Forecast; Recent Advances in Government Statistics—Panel; How Good Are Current Statistics for Following Economic Changes?; New Approaches to the Measurement of Saving and Investment; Economic Forecasting Techniques II; Statistics on Mobilization; Determinants of Productivity Levels. *Price:* \$2.00 to members; \$3.00 to others.

Copies of both publications may be ordered directly from

The American Statistical Association, 1757 K St., N.W., Washington 6, D. C.